FEBRUARY 1951

American FRUIT GROWER

· NEW SPRAY PRACTICE ·

SAVE FARM DOLLARS WITH

NEW FORD TRUCKS for '51

Truck-of-all-farm-work is this Ford Series F-5 . . . only Ford gives you a choice of V-8 or Six with Power Pilot Economy.

NEW! Ford step-ahead engineering brings you greater economy—better performance!

Rugged, money-saving Ford Trucks have long been the farmer's favorites. And these new Ford Trucks for 1951 will be even greater favorites. Ford's step-ahead engineering offers NEW strength that prolongs truck life . . . NEW massive, modern front end that makes Ford the style leader . . . NEW cab features to improve riding ease . . . NEW all-around values to *save you money!*

NEW! Over 180 Models—95-h.p. Pickups to 145-h.p. BIG JOBS!

NEW! Car-like shifting ease with new steering column gear shift in Series F-1. NEW! 5-STAR and 5-STAR EXTRA Cabs with extra wide rear windows for 50% more safety vision. NEW! Top engine performance is maintained with new autothermic pistons, new chrome-plated top piston rings and new high-lift camshafts.

NEW 6½-FT. PICKUP

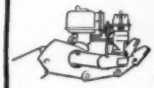
America's No. 1 farm truck, the Ford 6½-ft. Pickup has a new body with hardwood floor, new grain-tight tailgate. Choice of V-8 or Six, both with Power Pilot Economy.

5-STAR EXTRA Cab shown available at slight extra cost.

FORD TRUCKING COSTS LESS because

In the low-price field ONLY Ford Trucks give you

POWER PILOT ECONOMY



The Ford Truck "POWER PILOT" is a simpler, fully proven way of getting the most power from the least gas. It *automatically* meters and fires the right *amount* of gas, at precisely the right *instant*, to match constantly changing speed, load and power requirements.

Unlike conventional systems, the "Power Pilot" uses only *one* control instead of two, yet is designed to synchronize firing *twice* as accurately. You can use regular gas . . . you get no-knock performance. Only Ford in the low-price field gives you Power Pilot Economy!

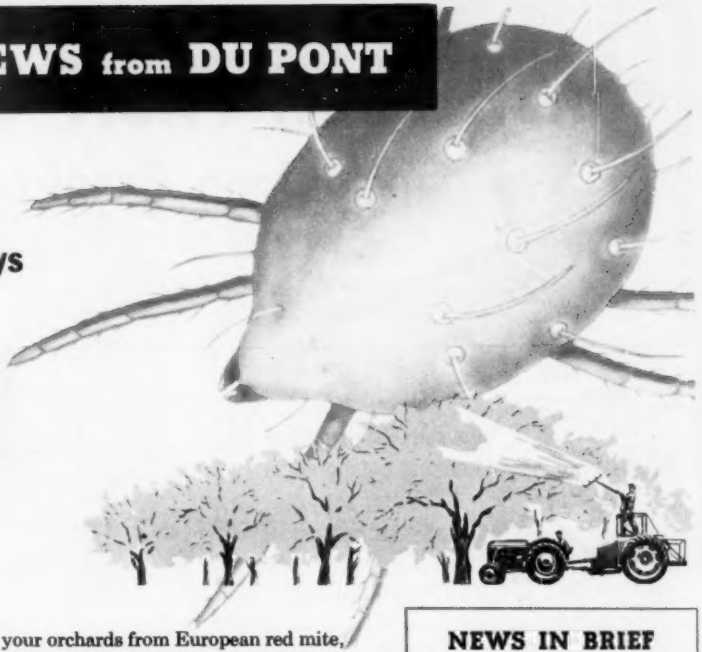
FORD TRUCKS LAST LONGER!

Using latest registration data on 6,592,000 trucks, life insurance experts prove Ford Trucks last longer!

Entered as second-class matter at Post Office at Cleveland and Willoughby, Ohio, under the Act of March 3, 1879. Additional entry at Mount Morris, Illinois.

FARM NEWS from DU PONT

Control Mites in Fewer Sprays with DU PONT EPN 300 Insecticide



Now you can protect your orchards from European red mite, Two-spotted mite, Pacific mite, Willamette mite and Schoene mite with effective EPN 300 Insecticide. This new product of Du Pont research gives you new advantages:

Effective clean-up. EPN 300 produces prompt results so you get relatively quick control of mites on apples, pears, peaches and other stone fruits, and nuts.

Long-lasting control. Residual action of EPN 300 is good. Thus you need fewer sprays to keep mites down.

For other pests, EPN 300 also shows promise against pear psylla, plum curculio and certain other insects attacking fruit trees.

Compatible. EPN 300 mixes readily with most other pest-control chemicals, and with "NuGreen" nitrogen fertilizer.

See your dealer for EPN 300 Insecticide and for other Du Pont pest-control products. Ask him for free booklets, too, or write Du Pont, Grasselli Chemicals Dept., Wilmington 98, Delaware.

DU PONT EPN 300
INSECTICIDE

DU PONT CHEMICALS FOR THE FARM INCLUDE:

Fungicides: PARZATE,® (Liquid and Dry), FERMATE,® ZERLATE,® Copper-A (Fixed Copper), SULFORON® and SULFORON®-X Wettable Sulfurs . . . *Insecticides:* DEENATE® DDT, MARLATE® Methoxychlor, LEXONE® Benzene Hexachloride, KRENITE® Dinitro Spray, EPN 300 Insecticide, Calcium Arsenate, Lead Arsenate . . . *Weed and Brush Killers:* AMMATE,® 2,4-D, TCA and 2,4,5-T . . . *Also:* Du Pont Cotton Dusts, Du Pont Spreader Sticker, PARMONE® Fruit Drop Inhibitor, and many others. ®REG. U. S. PAT. OFF.

On all chemicals always follow directions for application. Where warning or caution statements on use of the product are given, read them carefully.

Listen to Du Pont "CAVALCADE OF AMERICA"—*Tuesday Nights—NBC Coast to Coast*

DU PONT

BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

NEWS IN BRIEF

Up to 74% more scab-free fruit is the report from New York State apple orchards where "Fermate" fungicide proved itself far better than sulfur for scab control and fruit yield. "Fermate" controlled scab without injury to foliage, even in the hottest weather.

★ ★ ★

With peaches, "Zerlate" controls brown rot and keeps off the Japanese beetles at the same time. "Zerlate" has proved to be consistently excellent for control of brown rot and leaf spots on cherries, plums and peaches.

★ ★ ★

Last year's experience of grape growers again showed how superior "Fermate" is for control of black rot. Some of the highest yields and highest sugar content were reported from vineyards where it was used regularly.

★ ★ ★

For cherries, early apples and other early harvested fruit, DuPont "Marlate" methoxychlor insecticide is highly recommended. It gives excellent control of cherry fruit fly and fruit worm, plum curculio, apple flea weevil, codling moth, Oriental fruit moth and Japanese beetle. And it can be used close to harvest because the residue stays effective against insects, yet it is not hazardous to people who eat the fruit.

★ ★ ★

"Marlate" is ideal for control of insects on vegetables, too: cucumber beetle, Mexican bean beetle, tomato worm, corn earworm, leaf-hoppers, flea beetle, cabbage worms, looper and others. Moreover, "Marlate" is mild on the foliage, safe even on sensitive cucurbits, and residues of it are not hazardous to people.

SAVE YOUR FRUIT CROPS
with Alcoa Cryolite

It's Dependable—It's Selective

1

You can depend on ALCOA Cryolite to control codling moth. It has been time-tested and proved.

2

ALCOA Cryolite is selective. It helps save the beneficial insects that destroy aphids, red mites and leaf rollers.

3

ALCOA Cryolite is a good mixer, has high suspendability in the spray tank and negligible abrasive action on spraying equipment.

4

ALCOA Cryolite is safe on delicate foliage, and doesn't affect soil balance.

ALCOA CRYOLITE IS READILY AVAILABLE FROM LARGE STOCKS.

***FREE*-Dusting and Spraying Chart showing wide variety of uses sent on request**

★ ★ ★

ALUMINUM COMPANY OF AMERICA

CHEMICALS DIVISION

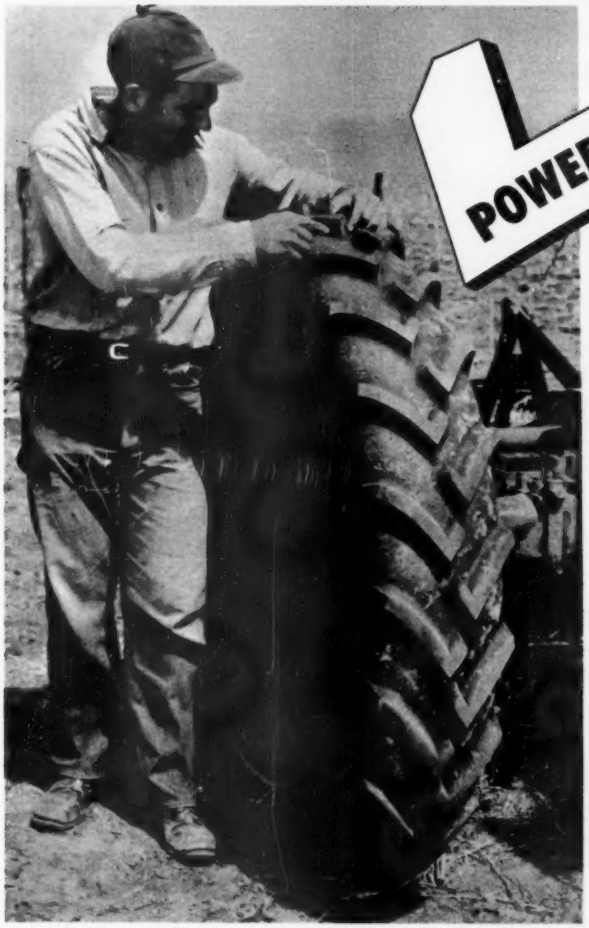
645B Gulf Building Pittsburgh 19, Pa.

★ ★ ★ ★ ★ ★

Packed in 50-lb. bags, 6-lb. bags and handy 1-lb. shaker cans.

Alcoa Cryolite Insecticide

NEW B.F. Goodrich



Duane Auer of Eldorado, Kansas, says, "We find we have much less slippage with B. F. Goodrich Power-Curve tires. They have a better grip in sandy soil, hold tight in mud."

POWER-CURVE TIRES

OUTPULL OTHER LEADING BRANDS —LAST LONGER

VICTOR AUER and his son, Duane Auer, farm 1200 acres on Route 4, Eldorado, Kansas. Here they raise corn, barley, sargo and livestock. Altogether, they have about 350 steers, cows and calves.

"When we were in the market for tractor tires," said Duane Auer, "we gave much thought to the type of soil and conditions under which we work . . . so we picked the new B. F. Goodrich Power-Curve tires. Our experience shows they have a much better grip in sandy soil and also hold tight in mud. We find that we have much less slippage. All of our trucks, tractors, drills and other machinery have B. F. Goodrich tires."

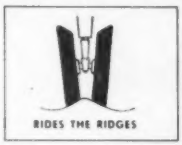
Farmers everywhere like the extra traction and longer wear they get from B. F. Goodrich Power-Curve tires. On this tire each high, tapered cleat has an arrowhead nose that digs right in. The curved cleats are high at the shoulders, high at the center—actually higher at the center than the cleats of the two other leading makes.

The cleats of the open center tread are evenly spaced, the same distance apart at the center as they are at the shoulders. That makes the tread mesh with the soil like the teeth of a gear. And the whole tread is flexible. It gives as the tire rolls. Dirt drops out! Tread stays clean!

Because there's more rubber in the tread and because the cleats don't bend and scrub, you get longer wear. Many farmers will get as much as a year of extra wear with this new tire.

For greater traction and longer life, replace with this powerful new tire. And specify B. F. Goodrich tires when you buy a new tractor.
The B. F. Goodrich Company, Akron, Ohio.

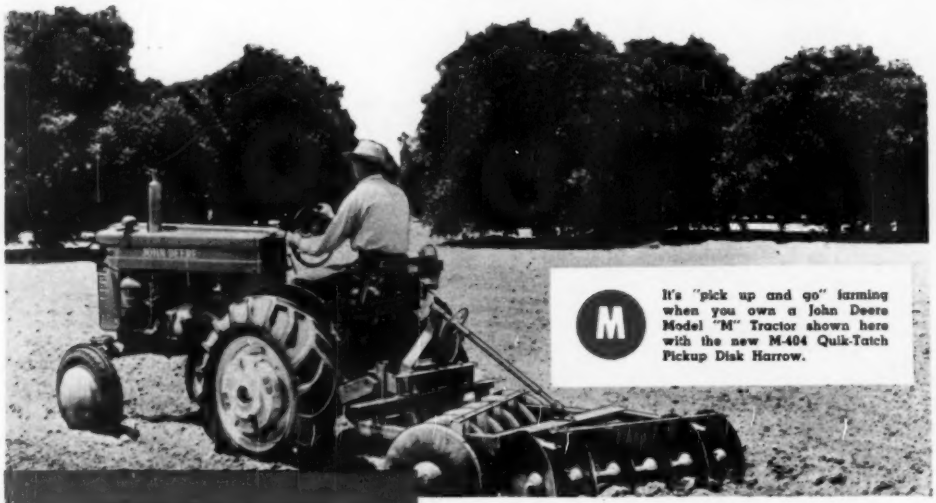
—— Save with this new kind of front wheel tire ——



This new type front wheel tire first made its reputation in the lister corn country. Now farmers everywhere want it. It follows the furrows or rides the ridges. Protects your crops. Makes steering easier. Tread is specially compounded for extra-long wear. See the BFG retailer.

YOU'LL LIKE THESE MODERN GENERAL-PURPOSE TRACTORS

They Have So Many Features You Want



M It's "pick up and go" farming when you own a John Deere Model "M" Tractor shown here with the new M-404 Quik-Tatch Pickup Disk Harrow.

MT

MC

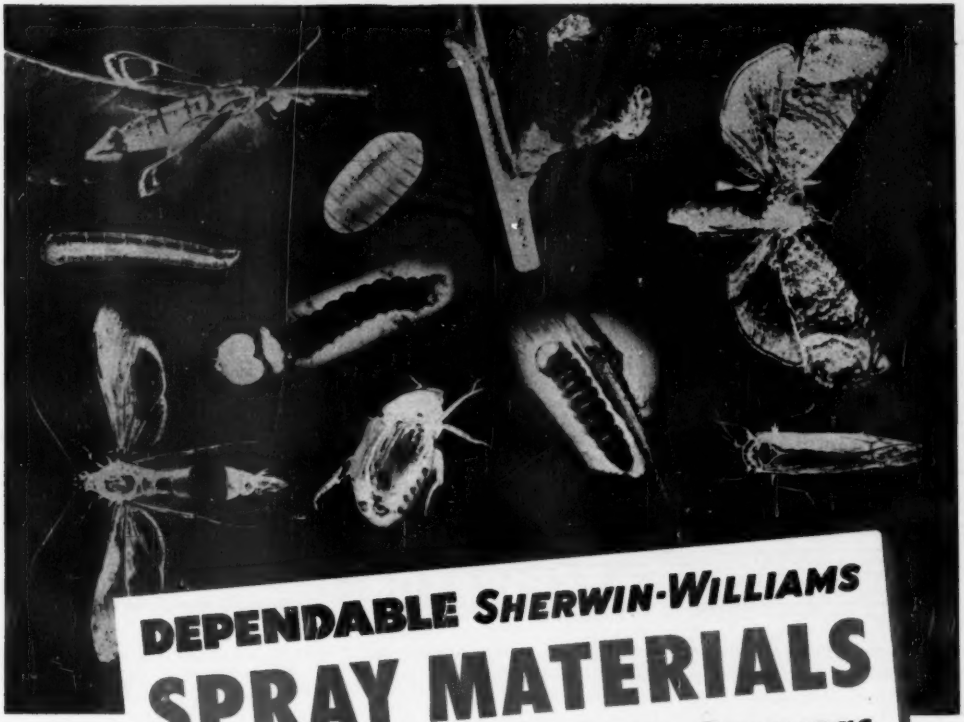
Whether you farm a small acreage or large, the light but powerful John Deere "M" and "MT" Tractors are planned and built to save you time, money, and energy on every job.

Here is adequate weight, properly distributed to give you extra lugging power . . . here is Touch-o-matic hydraulic control for an ever-growing line of Quik-Tatch equipment . . . here is 4-speed transmission, "a speed for every need" . . . a simple, 2-cylinder engine that's easy on fuel and oil, and easy to service . . . here is extra comfort and ease of handling that make long days in the field seem shorter.

You will want to see and drive these modern John Deeres—get all the facts on their many extra-value features. See your John Deere dealer. Write today for free literature.

JOHN DEERE

MOLINE ILLINOIS



DEPENDABLE SHERWIN-WILLIAMS SPRAY MATERIALS

Complete Line for Fruit Growers

For effective control on apples, cherries, peaches, pears and other fruits, use Sherwin-Williams tested and proven insecticides and fungicides and other spray materials. We have served the fruit growers of America for many years and *will continue to supply* products which our research and experience show are the most satisfactory from the standpoint of effectiveness and economy. Our plant at Bound Brook, N. J., is one of the largest and most modern in the country devoted entirely to the manufacture of insecticides and fungicides.

Obtain your spray material requirements from the Sherwin-Williams Insecticide dealer in your locality. You can depend on the Sherwin-Williams line.

SHERWIN-WILLIAMS SPRAY MATERIALS

- S-W Arsenate of Lead
- S-W Aphamite (15% Parathion)
- S-W Basi-Cop (Tri-basic copper sulfate)
- S-W 50-50 DDT Wettable
- S-W Dimite (Miticide)
- S-W Fle-Mulsion (Dormant oil spray)
- S-W Karbam Black (Ferbam)
- S-W Karbam White (Ziram)
- S-W Mulsoid Sulfur (Micronized sulfur)
- S-W Sulfix Sulfur (Microfine sulfur)
- S-W Safe-N-Lead (Zinc safener)
- S-W Sprolastic (Spreader and sticker)
- S-W Spred-Rite (Spreader and sticker)
- S-W Summer Mulsion (Summer oil spray)
- S-W Stop Drop (Naphthalene acetic acid)

THE SHERWIN-WILLIAMS CO.

INSECTICIDE-FUNGICIDE DIVISION

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101 Prospect Ave., N. W.
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Improved Design for Better Fit, Easier Wearing and

better protection against PARATHION INSECTICIDES

AGRISOL RESPIRATOR

If you handle Parathion in any of its forms—dry or wet—you need the new WILLSON AGRISOL RESPIRATOR for effective protection against inhalation of its dust, mist or vapor.

The facepiece has been redesigned with a flexible, rolled edge giving a snug, comfortable fit, particularly across the bridge of the nose. A new style dual elastic headband on the respirator combines with the rolled edge to make this respirator dust-tight. The dust-filtering discs and vapor-absorbing cartridges are easily replaced.

Ask for these protective devices at your insecticide dealer's or write to us direct. Descriptive bulletins available.

Dual filtering area assures ease of breathing. Filter disc held securely against exposed side of cartridge by threaded retaining ring. Complete with 2 cartridges and 12 filters . . . . . .

$4.50 each

The WILLSON *MonoGoggle adds necessary eye protection from front and sides. It is lightweight plastic with one-piece replaceable lens. Deep, flexible frame provides allday wearing comfort, even over prescription glasses . . .*

$2.25 each

WILLSON®

Established 1870

WILLSON PRODUCTS, INC. 118 Thorn St., Reading, Pa.

FEBRUARY 1951

VOL. 71 No. 2

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WE HAVE MOVED

We are happy to announce that AMERICAN FRUIT GROWER has moved its editorial, advertising, and circulation offices to a new and larger location at 106 Euclid Ave., Willoughby, Ohio. Please address all correspondence to our new address:

American Fruit Grower
106 Euclid Avenue
Willoughby, Ohio

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THE ONE INSECTICIDE FOR MANY PESTS

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CUCUMBER BEETLE
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GREENBUG
GREEN JUNE BEETLE GRUBS
LEAF FOLDER
LEAFHOPPERS
LEAF MINER
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LEAF TIERS
MAGGOT
MEALYBUGS
MEALY PLUM LOUSE
MELONWORM
MEXICAN BEAN BEETLE
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MITES (many species)
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ORIENTAL FRUIT MOTH
PARLATORIA SCALE
PEACH TREE BORER
PEAR PSYLLA
PICKLEWORM
PLUME MOTH
PLUM CURCULIO
PURPLE SCALE
RED BUG
RED SPIDER
SAN JOSE SCALE
SCURFY SCALE
SERPENTINE LEAF MINER
SNOW SCALE
SUCKFLY
THRIPS
TORTRIX
VELVETBEAN CATERPILLAR
WEBWORM
WHITEFLIES
YELLOW SCALE

Available from National Manufacturers in Wettable Powders Dilute Dusts Emulsifiable Liquids. See Your Supplier

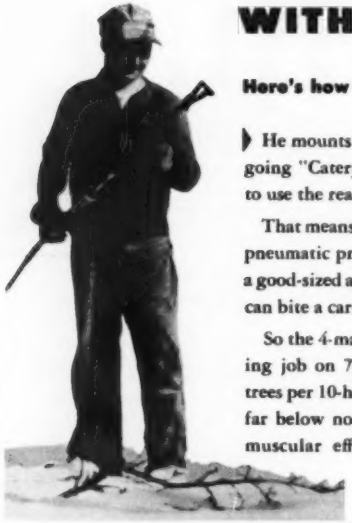
DOSAGES FOR THE CONTROL OF ALL THESE PESTS HAVE BEEN ACCEPTED FOR LABELING BY THE U. S. DEPARTMENT OF AGRICULTURE

AMERICAN Cyanamid COMPANY

Manufacturers of *Thiophos*® Parathion Technical
Agricultural Chemicals Division
30 Rockefeller Plaza, New York 20, N. Y.

WRITE FOR PARATHION GROWERS HANDBOOK

HOW TO PRUNE *75 trees daily* WITH A 4-MAN CREW!



Here's how Fred Nierman does it in his Monitor, Washington, orchard

He mounts a compressor on his sure-going "Caterpillar" Diesel D2 Tractor to use the rear power take-off.

That means air to spare to power four pneumatic pruners. They can shear-off a good-sized apple limb as fast as a horse can bite a carrot!

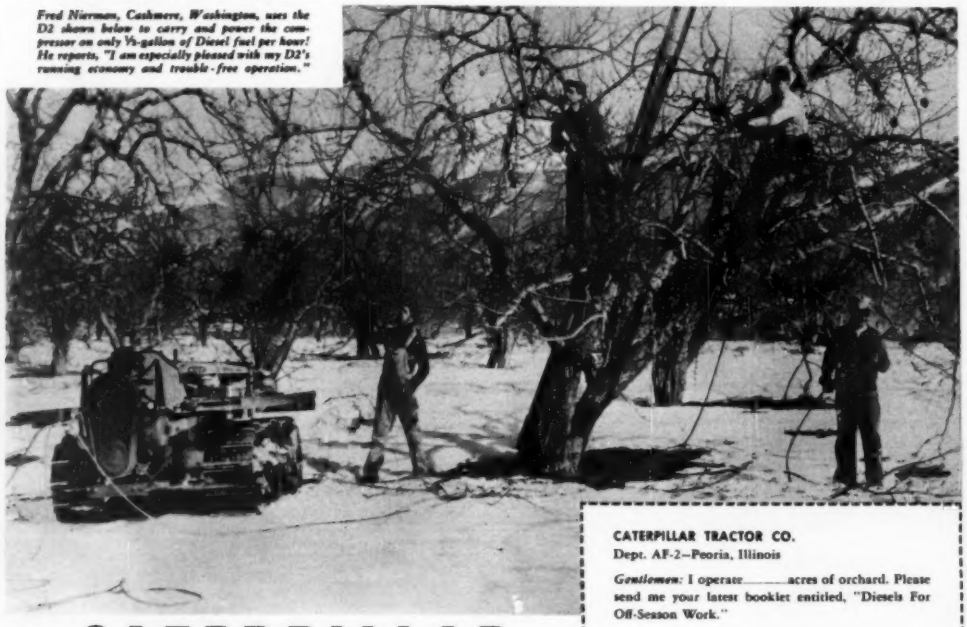
So the 4-man crew does a good pruning job on 75 to 80 good-sized apple trees per 10-hour day. Pruning costs are far below normal. And with so much muscular effort assumed by tireless Diesel power, the crew is easier to keep.

Multiplying manpower efficiency and cracking down on costs are "Caterpillar" Diesel Tractor advantages that fruit growers, the country over, are shrewdly applying. So is the all-weather traction, to deliver big-capacity power when and where needed.

Why not size-up "Caterpillar" Diesel Tractor performance and benefits for your orchard? See your nearby "Caterpillar" Dealer and use coupon.

Caterpillar Tractor Co. • *Peoria, Illinois*

Fred Nierman, Cashmere, Washington, uses the D2 shown below to carry and power the compressor on only ½-gallon of Diesel fuel per hour! He reports, "I am especially pleased with my D2's running economy and trouble-free operation."



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REG. U.S. PAT. OFF.

Diesel Farm Tractors

DIESEL ENGINES • TRACTORS • MOTOR GRADERS • EARTHMOVING EQUIPMENT

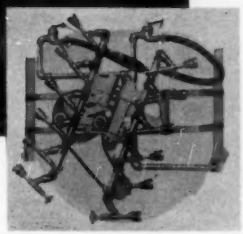
CATERPILLAR TRACTOR CO.
Dept. AF-2—Peoria, Illinois

Gentlemen: I operate_____acres of orchard. Please send me your latest booklet entitled, "Diesels For Off-Season Work."

*Name*_____ *R.F.D.*_____

*Town*_____ *State*_____

Myers Silver Cloud Spray Head works with any sprayer that has pump capacity to supply multiple nozzles. 8-gun or 12-gun models.



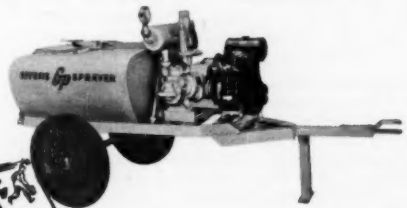
change your sprayer to a one-man outfit

Cut labor costs with this oscillating spray head

Install this new Myers Silver Cloud Spray Head on any power sprayer of adequate capacity—and you'll be all set for fast, thorough, *one-man* handling of your spray program. The tractor driver controls the entire operation. At the touch of a lever, he directs spray right or left . . . or to both sides at once . . . or instantly shuts off nozzles. The adjustable oscillating nozzle banks can be angled for complete coverage on trees of varying heights. Discharge can be set for everything from full fog to solid spray. Be sure to consult your Myers dealer about details. You'll be delighted to see how readily you can convert any good power spray rig to this latest cost-saving, labor-saving method of effective spray application.

Ask also about the complete Myers line of quality power sprayers. Capacities 6 to 50 gpm. Pressures 30 to 800 lbs.

New Myers General Purpose Sprayer. Capacity 7 gpm. Adjustable pressures, 30 to 400 lbs. Five different wheel and skid models.



Power take-off and engine-driven sprayers — 2-wheel, 4-wheel and skid mounted — for gun and boom operation.

TAKE OFF YOUR HAT TO **MYERS**

THE F. E. MYERS & BRO. CO., Dept. T-116, Ashland, Ohio

Send free descriptive literature on items checked:

- ☐ Power Sprayers
- ☐ Hand Sprayers
- ☐ Power Pumps
- ☐ Water Systems
- ☐ Water Softeners
- ☐ Hand Pumps
- ☐ Hay Unloading Tools

Name_____

Town_____ State_____

County_____ R. F. D._____

BLACK LEAF® PARATHION—Dustless

Black Leaf Parathion wettable powder formulations are now *dustless*. Available as 15% or 25% parathion, these desirable formulations are designed to avoid the problem of "dustiness" when the wettable powder is being handled. Permits the addition of the parathion wettable powder directly to the spray tank while refilling.

Black Leaf Parathion wettable powders are packaged in 2-pound bags, sixteen per shipping carton, for convenience in handling. Vapor-proof packaging eliminates undesirable odors in transit and storage, and protects the contents of the packages from deterioration. Use from ½ to 1¾ pounds in 100 gallons of spray, depending upon insects to be controlled, and other materials used in the same application.

Black Leaf Parathion wettable powders are effective against European Red Mite, Two-Spotted Mite, Pacific Mite, Brown Almond Mite, various species of Aphids, and certain other similar insects. Parathion, while extremely effective as an insecticide, is also highly poisonous to human beings if inhaled, absorbed through the skin, or swallowed. Danger may be minimized if, and only if, most stringent precautions are rigidly and constantly followed. Follow directions on labels, and consult local agricultural authorities for information as to timing of applications, etc.

Another member of the famous Black Leaf *family is* Black Leaf 40—*a volatile nicotine spray that destroys aphids and similar insects by contact and by fumes. Compatible with other standard spray materials. Well-known and widely-used by orchardists everywhere.*

Tobacco By-Products & Chemical Corporation • Richmond, Virginia

The "LEAF" that protects the tree is a "Black Leaf" SPRAY

LETTERS TO THE EDITOR

Soil Temperatures

Dear Sir:

I was very much interested in the article in your October number by Glenn Haskins, entitled "Some New Ideas About Orchard Sites and Frosts." I would like to know if the temperature of the blossoms is affected by the condition of the orchard floor; i.e., clean cultivated, sod, or sod mulch.

St. Catharines, Ont. G. L. Goodwin

There is a great deal of controversy regarding the effect of clean cultivation on blossom temperatures during frost conditions. G. N. Brancato, chief of the Weather Bureau at the Friendship International Airport, Baltimore, Md., makes the following reply: "The temperature of soil with a cover crop will normally fall to lower levels than the temperature of a soil with bare ground or with only a very short cover crop.

"The process of radiation takes place more rapidly from a soil with an appreciable cover crop than it does from bare soil. The height of the cover crop has the effect of bringing the colder temperatures nearer to the tree blossoms.

"In other words, the temperature is coldest near the top of the cover crop and, therefore, the air around the lower blossoms of the tree is colder than it would be if there were no cover crop. The variation in temperature around the blossoms can amount to several degrees, depending on whether the ground is bare or whether there is a high cover, the temperatures being the lowest when there is a high cover crop." —Ed.

Hort Meetings

Dear Sir:

In the December issue you had an article, "It's Hort Time." I am interested in attending one of these meetings and would like to know how arrangements can be made. Does one have to belong to some kind of a horticultural association? Whom should I contact to make the necessary arrangements and what are the financial charges for attending such a meeting?

Techny, Ill. Jos. L. Schaefer

It is not necessary to make any particular arrangements to attend a horticultural society meeting except for hotel accommodations, and one need not be a member to attend. There is no registration fee unless one joins the society. Membership dues are modest, amounting to only one or three dollars for a year.—Ed.

In Defense of Spraying

Dear Editor:

I am a Missouri fruit grower and skeptical by tradition. Lately I read where a prominent writer-farmer asserted, publicly, that "insects will not attack plants growing in a well-balanced soil."

In the light of my 20 years of experience in growing apples, peaches, grapes, plums, and berries, I ponder this statement of assumed fact. I recalled that the more attention I gave to the balanced nutrition of my trees and vines the more insects I had.

Then I asked Prof. T. J. Talbert, veteran chief of horticulture at the Missouri Agricultural Experiment Station, what he thought of trying to control insects in 1951 with a well-balanced orchard soil and no sprays. Part of his statement, which will leave no doubt as to the vital need for sprays to control insect pests, follows:

"Competent fruit growers who make a living from their trees and vines are now using, and have used for many years, fertile and well-balanced soils. Soil treatments include the use of legumes, mulches, animal manures, and adequate applications of commercial fertilizers.

"Yet such growers have, during the past 10 to 15 years particularly, observed a gradual increase in the damage of harmful and destructive insects in spite of the fact that their soils are better suited to the growing of fruit crops than ever before. Indeed, had it not been for the introduction and use of some of the new chemicals such as DDT, BHC, and others, many of the best growers declare that the upsurge of injurious fruit insects would have put them out of business.

"Furthermore, additional sprays have been required. Supplementary insect control practices such as the removal of rough bark from trunks and branches, tree banding, discing the orchard soil in the fall, screening the packing shed, and prompt destruction of all drop apples have been needed to make possible the production of clean, marketable fruit.

"Were we ready to admit that different levels of soil fertility do help materially in controlling insects, the fact remains that no soil scientist is yet prepared to tell us what fertility balance for the various soil types would be required."

New Haven, Mo. Guy Trail

Look Before You Leap!

Dear Editor:

The greatest mistake of a lifetime is often made, especially by those of middle age and upward, in deciding to move from the fruit farm place to a boom section. At that time in life one cannot as readily adapt himself to the new situation as a younger person might do.

Before deciding to move from your old homes, give close attention and study to actual conditions obtaining in the new venture. There are some things of more value than mere soil, products, or climate—even if these are to be bettered by a change of location.

Hammonton, N. J. Mrs. C. A. Umosella

Flaws and Applause

Dear Editor:

I am writing to let you know that I like your feature, "The Orchard Home." My husband had been saying that your magazine needed a woman's page and a young people's page. Now that you have the woman's page let us hope it proves so successful that you will start a column for the young people—then your magazine will be complete.

I hope that this year will be a big one for you and the fruit growers all over.

Dumont, N. J. Mrs. R. A. Rambeau

Dear Sirs:

I don't like to pick flaws in an excellent magazine, but I can't resist writing about your recommendation for using alfalfa, ladino, and alsike as a permanent cover in a young apple orchard (Question Box, December, 1950).

Any of these legumes makes ideal food for the buffalo tree hopper. And this insect can really exterminate young apple trees. I've seen it happen!

Ames, Iowa J. H. Lilly

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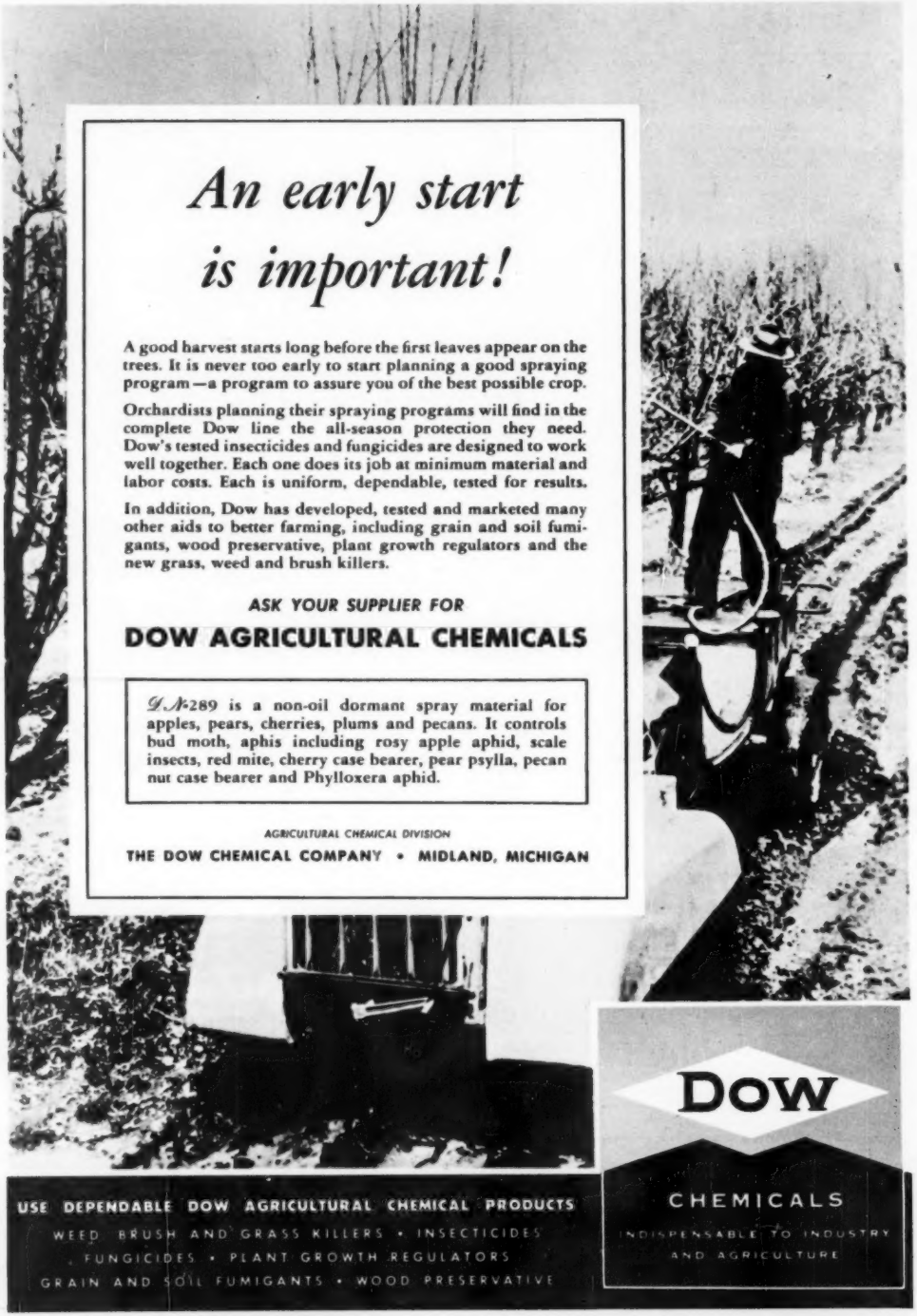

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INDISPENSABLE TO INDUSTRY AND AGRICULTURE

Trends In ORCHARD INSECT CONTROL

By B. A. PORTER, *U.S. Department of Agriculture*

Fruit growers perhaps will not immediately recognize the insect shown in the illustration, for it as well as the grape cluster of bloom buds on which it is feeding, is greatly enlarged. The insect is the rose chafer, one of the multitude of insect pests for which entomologists and insecticide manufacturers are constantly seeking better materials and methods of control. The photograph is printed through courtesy of A. L. Jenkins, assistant professor of entomology, University of Missouri.—Ed.

THE COMPLEXITY of the orchard insecticide situation is well shown by the number of materials discussed at the spray residue hearings. Evidence was given on 80 or more insecticides, of which at least 25 were unknown 10 years ago. In addition, there are numerous materials in the early stages of development that were not discussed at the hearings. No wonder entomologists find it hard to get full experimental information promptly on everything that is offered!

Instead of attempting the impossible job of reviewing in detail all of these insecticides within the limits of the present article, I will mention briefly a few of the events and trends that are of current or future interest to fruit growers.

There has been much interest in the spray residue hearings, held by the Federal Security Agency. The outcome of these hearings may have a profound effect on the fruit industry. The hearings have been closed, after being in session on 82 different days, from January 11 to September 15. The presiding officer was most fair and gave all witnesses full opportunity to present all evidence they wished. More than 250 witnesses were heard. Many of them testified on the necessity for using various insecticides to control pests of fruits or vegetables. This is something that fruit growers have known all their lives, but under the law tolerances can be set only for materials that have to be used. And evidence to this effect must be in the record. Two witnesses opposed the use of insecticides as being unnecessary and undesirable.

The record of the hearing covers some 9,000 pages, and over 1,300 exhibits were presented by the various witnesses. These exhibits varied from a single table or chart to entire books or bulletins. The control of insects and diseases on fruits and vegetables was discussed with the greatest thoroughness. As a result, the record and supporting exhibits give the most complete story of fruit and vegetable pest control that has ever been brought together in one collection.

Before tolerances can be set, this mass of testimony must be reviewed and summarized, which is an enormous job. The information presented on each insecticide must be classified and summarized by pests and by crops. The information on the toxicity of the various materials, secured mostly on laboratory animals, must be translated into terms of dangers to consumers, a subject on which opinion is far from unanimous. The entire review process and the procedure set forth in the law will take many months, and tolerances are unlikely to be announced in time to affect the production of the 1951 crop.

In spite of its dangerous nature, parathion was used extensively in 1950, and indications are that its use will continue to increase in 1951. Parathion meets a long-standing need in plum curculio control in eastern peach orchards. It also controls many other peach pests—the oriental fruit moth, European red mite, and others. On apple it is one of the best materials for mite control, if two or more successive applications are made. However, parathion cannot be used safely on McIntosh and related varieties. It often injures their leaves or fruit.

Parathion also gives control of various scale insects on apple and peach when several applications are made during the summer. It also shows great promise for the control of scale insects on citrus, and may reduce or eliminate the need for oil sprays, which interfere with coloring and reduce the quality of citrus fruits. However, parathion is not very effective against the more important mites on citrus.

Although in a number of sections some orchard workers were made sick in 1950 by using parathion, such cases were fewer than might have been expected. Extensive publicity was given to the dangers involved and the precautions that should be followed in using parathion. Both official agencies and the insecticide companies did a thorough job of informing growers on these points.

Although orchard workers using parathion fared reasonably well, at least one death and numerous cases of illness were reported in one orchard section where dusts released from aircraft drifted into homes located close to the orchard being treated. A similar situation resulted in Utah from the dusting of alfalfa by plane. In both cases the insecticide was probably parathion, although it may have been tetraethyl pyrophosphate (TEPP).

At least 16 deaths have been reported from the use of parathion in certain countries in South America during the past year or so. The same thing can still happen here, if we get the notion that the precautions advised for the use of parathion are just bunk. This insecticide should still be treated with the greatest of respect.

Because of the great effectiveness of parathion, much attention is being paid to closely related compounds, containing phosphorus, that might have the good qualities of parathion without such a serious hazard to the

(*Continued on page* 40)

SPRAYING SPELLS SUCCESS

By MELVIN L. HAYES

The H. G. Moore Orchards in Ottawa County, Ohio, have established an enviable record for blemish-free fruit by closely following the recommendations of their state experiment station.

A FEW YEARS AGO apple grower Harold G. Moore was out on a limb.

"Around our buildings the codling moths were so numerous most of the apples we grew were culls," the Oakharbor, Ohio, fruit grower declared. "And the situation certainly wasn't encouraging elsewhere in the orchard. We were losing money and enthusiasm."

The situation has changed. In 1949 Mr. Moore, for the second year, was fourth among Ohio orchardists in the per cent of clean fruit produced. After inspecting 2,800 apples, the state examiner was "unable to find a single apple scab blemish or injury from curculio." The codling moth scored only 0.11 per cent, and other insects and diseases rated a meager 0.07 per cent.

What was the solution to their problem? Plenty of spray solution.

"The right kinds and amounts of spray, properly timed, have been the most important factor in our procuring fruit free from blemishes," the 62-year-old Ohioan said emphatically. But he stresses that he has received a lot of assistance in making his spraying program click.

"I wouldn't be to first base if it hadn't been for the experiment station men," he explained. "We fruit growers fail to give them enough credit for their help. They have done a masterful job for me."

In a five-year program beginning in 1945, Mr. Moore was chosen to work closely with the Ohio Agricultural Experiment Station at Wooster. His orchard then was inspected regularly for insects and diseases. At first he was not even among the top 25.

In 1949, with fruit 99.82 per cent clean, he ranked first in Ottawa County and fourth in the Buckeye state. The average for the orchards checked (48 were visited, 36 examined thoroughly) was 98.14 per cent.

The first step in Mr. Moore's program is book learning. He keeps up on the latest developments in the spraying field so he can put profitable ideas to work.

More important than this cramming, though, he declares, is what he has been taught personally by the state fruit specialists. They know how to make money grow on trees.

"It would be fine if fruit growers could have more of this on-the-spot, practical guidance," Mr. Moore said.

Know how, it should be pointed out, must be supplemented by know when —a significant factor in spraying. The sense of timing is somewhat like the instinct of knowing when to plant a crop, he explained.

However, one soon finds there is

(*Continued on page 42*)

The photograph at the top shows the type of sprayer H. G. Moore and sons altered to fit the needs of their orchard. In the above photograph Mr. Moore is checking one of the two eight-nozzle brooms used by his spraymen, one of whom stands on the low, rear platform, the other forward and on top of the sprayer.

FRUIT DISEASE CONTROL

A Progress Report on the Fungicides Proving Most Effective in Control of the Important Diseases Affecting Fruits

By M. C. GOLDSWORTHY, *U. S. Department of Agriculture*

COPPER and sulfur compounds, long the standard materials for the control of diseases in our deciduous fruit orchards, are still extensively used. Their use through the years has resulted in adequate control of many of the diseases. This control, however, has often been accompanied by plant injury and for this reason considerable research to find suitable substitutes has been conducted by federal and state institutions and by fungicide manufacturers. This work has led to the discovery and introduction of a number of metallo-organic and purely organic compounds with fungicidal properties.

In the control of apple diseases progress is being made. Apple scab, cedar rust, powdery mildew, black rot, blotch, Brooks' spot, bitter rot, fly speck, and sooty blotch comprise the more important diseases.

For scab, black rot, and powdery mildew the sulfurs are still effective, cheap fungicides. For blotch, Brooks' spot, bitter rot, fly speck, and sooty blotch bordeaux mixture was formerly the standard material.

However, both the sulfurs and the copper fungicides cause injury to leaves and fruits. The sulfurs, especially, have been found to reduce the functional efficiency of foliage. For this reason ferbam (ferric dimethyl dithiocarbamate), Phygon (dichloronaphthoquinone), glyoxalidines (Crag), quaternary compounds (Stanofide), and phenyl mercury (Puratized, Tag, Dyancide, etc.) compounds are being used more and more as substitutes.

Scab is mainly a problem of the early season and the period most important in control is from the time leaf surface is first exposed up to the petal-fall stage. Some growers are taking advantage of the knowledge that treating the old dead apple leaves on the floor of the orchard with an eradicant type of fungicide will greatly reduce the potential disease in the orchard. The old leaves are sprayed with the aid of various mechanical devices with dinitro compounds, such as Elgetol or Krenite. These are applied at the rate of 400 to 500 gallons per acre of a one-half per cent solution of the commercial product in water. Ground spraying should be done at the time the buds start to crack in the early spring.

Spraying old dead apple leaves on the floor of the orchard to reduce scab infection.

Ferbam is being used considerably for apple scab control. In some cases, especially where scab is not severe, ferbam is used from the time buds crack throughout the season, since it is effective in controlling most of our apple diseases. Ferbam is especially effective against cedar rust and often this material is added to sulfur to insure both rust and scab control. While ferbam does not injure leaf surfaces, it does injure the finish of the fruit of some varieties.

Phygon also is very effective against scab and can be used to good advantage in the prebloom and bloom periods when its tendencies to cause leaf chlorosis and fruit spotting are negligible. In later applications it causes fruit spotting.

The glyoxalidines have proved to be very good fungicides against scab and are being used to some degree. Under certain environmental conditions they injure the finish of the fruit and are not very popular because of this.

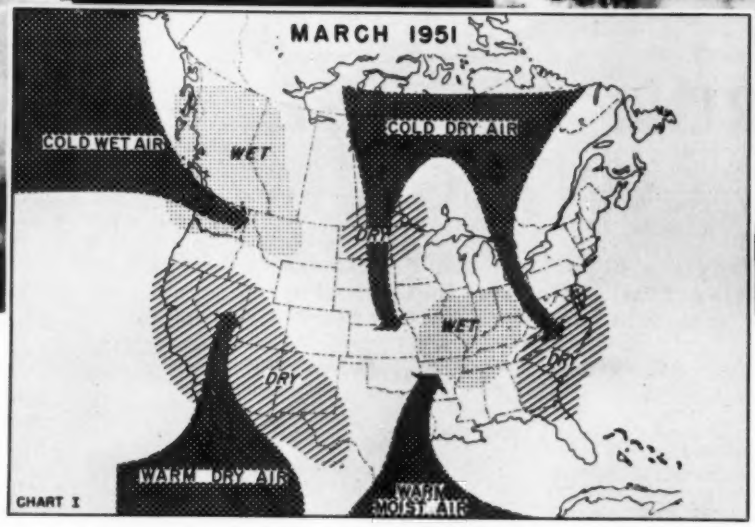
The phenyl mercury eradicant fungicides are being used more and more by growers, especially in those cases where, due to circumstances beyond their control, such as inclement weather unsuitable for spraying, scab infection has occurred prior to the application. These materials are very effective in killing established scab infections on leaves and also on fruits if the lesions are not too far advanced. They do not cause appreciable injury to leaves or fruits and are becoming popular because of this. Their use is particularly adapted to the bloom period of growth. Their use later than the calyx stage may result in a residue problem.

It is not safe to rely entirely on early applications of phenyl mercuries to control scab for the entire season since they do not have any appreciable residual or protective properties. Mild fungicides in the cover sprays, following phenyl mercuries at the blossom stage, should provide excellent control.

In the past the so-called summer diseases of apples, such as blotch, Brooks' spot, bitter rot, fly speck, and sooty blotch, were controlled with copper compounds. This practice has always been accompanied by the risk of leaf and fruit injury. The advent of ferbam has changed this picture and it is now becoming a regular orchard practice to employ ferbam in the control of these summer diseases.

For the powdery mildew fungus, which develops on only a few of our commercial varieties and under special conditions of environment, sulfur sprays are fairly effective. Many of

(*Continued on page* 55)



1951 SPRING

By IRVING P. KRICK
American Institute of Aerological Research

IN THE eastern sections of the country the warm winters of the past two years led many persons to wonder if their climate had begun to turn markedly warmer. The weather of the current winter should dispel most of these beliefs.

Since early November there has been a succession of cold air flows into eastern United States, the most notable example being highlighted by the snowstorms and blizzards of November 25-28. In sharp contrast to the early winter months of 1949-50, November and December, 1950, temperatures averaged considerably below normal in many eastern and midwestern areas.

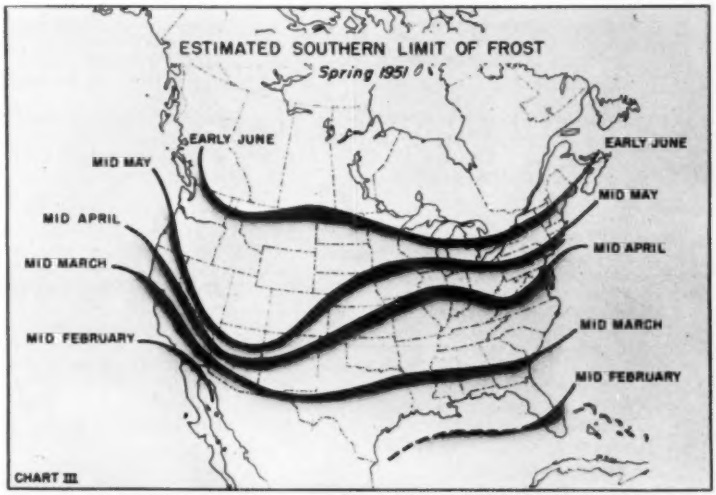
Along with these marked differences in the eastern weather patterns there have been noticeable differences from the last few years in the West. Warmer weather has prevailed during the early winter months in the western regions, and in the northern sections of the Pacific coastal areas rainfall has been abundant. The principal region of deficient moisture during the fall and early winter has been the southwestern section of the country including southern portions of the Great Plains.

Just as the current winter is developing in strikingly different fashion than last year, the coming spring weather should also bear only a small resemblance, in general, to 1950 conditions.

Charts I and II show the dominant air currents which should prevail during the months of March and April, 1951. As indicated, March should see a continuation of the cold air flows into the eastern sections of the country while warm air currents dominate the south and southwestern areas.

Chart II, however, graphically illustrates the shift in weather patterns which is expected during the spring. The principal cold air path during April should be shifted well to the west of its March position and the eastern sections of the country are expected to come under the influence of warm, moist air currents from the Gulf of Mexico. As a result, the eastern portions of the country are likely to have a relatively early spring, with a later than normal spring in prospect for the West.

Chart III shows the estimated southernmost limits of frosts for various periods during the coming spring season. In general, the chart reflects the events pictured in Charts I and II and shows late season frosts in the western sections of the country; but the last killing frosts of spring should occur earlier than normal in the East.



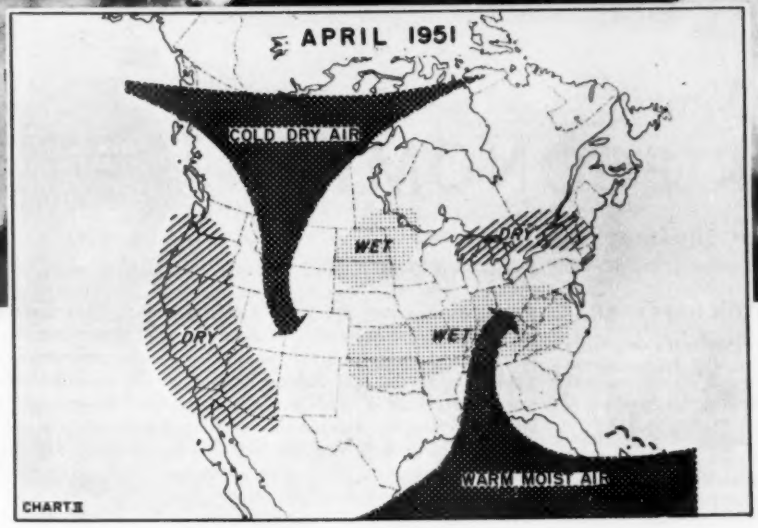


CHART III

WEATHER ?

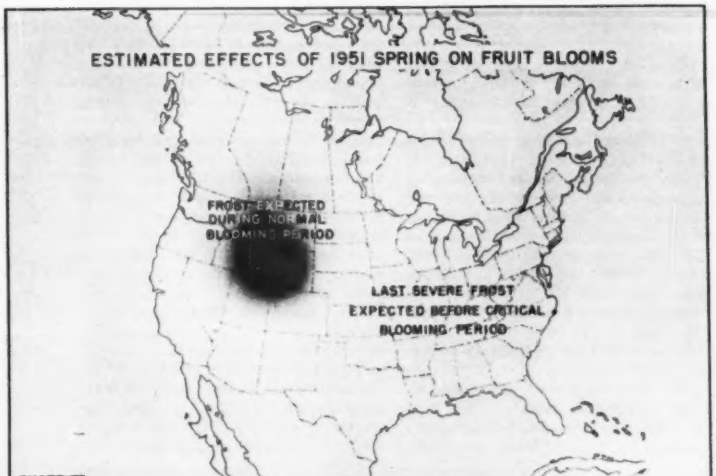
Cold or Warm •

Chart IV shows the areas of the country where frosts are likely to occur near the normal time for fruit blooming. Fruit crops in only a small portion of the western sections of the country appear to be threatened by frost damage during this critical phase. Throughout the balance of the country last frosts of the season are expected before the normal blooming and no widespread frost damage is likely in these areas.

With the weather conditions expected to occur during the coming spring months fruit prospects for the country as a whole appear more favorable than last year.

In Georgia and the Carolinas, the cold temperatures of the current winter and the absence of late spring frosts should combine to give an excellent peach crop in great contrast to last year. The winter and spring in California are expected to be warmer than the past two years and citrus fruit damage should be considerably decreased.

Only in portions of Washington and Idaho are the unfavorable weather conditions of last year likely to recur to any extent. In these states late frosts may cause appreciable damage to portions of the fruit crop. Also, in the Pacific Northwest the late frosts may delay the apple crop at the start of the season, but in the balance of the country early season prospects for the apple crop appear more favorable.


ESTIMATED EFFECTS OF 1951 SPRING ON FRUIT BLOOMS
FROST EXPECTED DURING NORMAL BLOOMING PERIOD
LAST SEVERE FROST EXPECTED BEFORE CRITICAL BLOOMING PERIOD
CHART IV

Peach growers of the Carolinas and Georgia, whose production tumbled the last few years from a 1939-48 average of over 12 million to a low of less than two million bushels in 1950, because of unusually mild winters followed by severe frosts and freezes, will be heartened by Dr. Krick's weather predictions for 1951. Citrus growers of California whose losses from freezes in 1949 and 1950 totaled millions of boxes of oranges, lemons, and grapefruit, likewise will experience improved weather conditions.

The New WAR ECONOMY

What Shortages Will Develop —AND WHEN?

By LARSTON D. FARRAR

DURING the past five years American industry has made tremendous strides in re-equipping, modernizing, and improving its production techniques. It is in far better position to produce tremendous quantities of goods than a year ago. But the surging civilian boom economy atop the new war economy is bound to create dislocations in supplies. Shortages of almost anything necessary in fruit growing operations are bound to show up from time to time. If you have not already acted, it is high time to make your needs known for the coming season, as pointed out by American Fruit Grower's Washington Correspondent.

SUFFICIENT unto the day is the evil thereof. But fruit growers, for their own good, must plan ahead in these trying times if they are to anticipate and to find answers to many of the supply problems that will face every man on a farm, in a factory, or in business.

It is difficult for *anyone* to predict exactly what manifestations will take place in the economy in the months to come. Perhaps not even Charles E. Wilson, director of the Office of Defense Mobilization, would be bold enough to tell every farmer how the coming cutbacks, confusions, and complications will affect this or that person, community, or region. But the broad outlines of the tremendous industrial effort America will be called upon to make in the coming months now are emerging. And the dangers to this or that industry are becoming less foggy than they have been.

Going on the theory that Russia will not precipitate a general war by attacking in Europe or making an A-bomb attack on the U.S. (*quite* an assumption but one that must be made for purposes of planning), it can be said, definitely, that American farmers will *not* feel in 1951 the shortages of materials and pesticides and equipment they felt at the height of World War II.

This is due to many causes, principal among which is that American industry is in a far better position now to produce the tremendous quantities of goods needed by the civilian population and the military than it was in 1940 and the following year. During the past five years American industry has made tremendous strides in re-equipping itself, modernizing its plants, and improving industrial production techniques.

Simultaneously, due to the liquidity of the farmers following World War II, there has been a tremendous program of mechanization and physical improvement going on in orchards and on general farms. In the production of almost any farm product possible to name, as in the making of almost any standard industrial product, it is safe to say that it can be made better and at relatively less cost (overlooking the differences in the purchasing power of the dollar) than ever before.

In short, both industry and farming are more efficient now than formerly and they can do more with fewer men.

The supply of almost any item used on a farm, from a quantitative standpoint, probably will be greater this year than it was, say, in 1940. But the *demand* for the available production will be so great that there will be shortages in almost every line possible to name before the end of 1951. Shortages here and there, now and then—not overall shortages all the time.

When—that is, *what month*—these shortages show up in *your* territory will depend on many factors, including the present supplies of wholesalers in your territory, the rate at which fruit growers heretofore have equipped themselves with necessary machinery, etc. By year's end, it is likely that shortages will be cropping up everywhere.

Take machinery, for example. This can include anything from trucks to sprayers. Every piece of machinery is made of metal.

A four million-man armed force means that the Army, Navy, and Air Force are going to be demanding huge chunks of metals. The big bottleneck is not in the manufacturing of the items made of metals but in the raw materials that go into these metals. While the armed forces are seeking to buy all the metals they possibly can, the Munitions Board, after years of lackadaisical effort, is striving feverishly to build up a huge industrial stockpile of strategic materials, including many minerals and metals needed by industry right now to supply the demands of the armed services for finished materials.

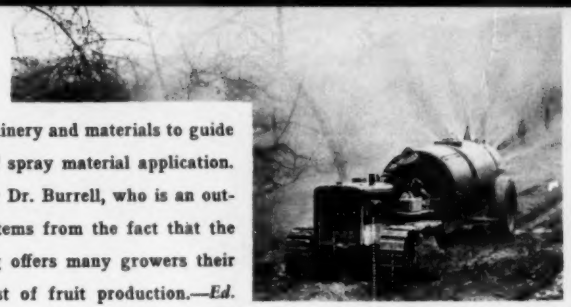
What happened in copper, at Christmastime, was that Uncle Sam requisitioned practically the entire supply of copper and clamped down on its civilian use without mercy. All use of copper for civilian purposes was cut off except where a manufacturer could prove he had to have it for a motor, or other machinery, and could not find an adequate substitute.

The same thing already had taken place in aluminum. Lead may be next on the list. Use of steel in manufacture of civilian items will be restricted greatly, if it has not been already. The talk is that automobile production will be cut back to four million units this year, which would mean that getting a truck by year-end would be like buying a car during World War II—obtainable only if someone dies or you are lucky enough to be first on the priority list.

Farm machinery manufacturers will be hit quite hard by the steel cutback order that was being readied in Washington in late January, as they already have been affected (although not disastrously) by other metals orders. The manufacturers themselves, of course, will turn to defense work and will not feel the pressure, but as the months roll around and distributors' stocks go down, the fruit man will feel the difference—first in his pocketbook and second in the time he must spend looking for a particular implement or part. A lot of farmers are going to be asking what became of the $75 billion worth of war materials destroyed or sold at penny-on-a-dollar prices after World War II.

The National Production Authority, an adjunct of the OWM, in mid-January was readying an order designed virtually to ban commercial

(*Continued on page* 59)



HERE is presented vital information on machinery and materials to guide the fruit grower in this newest method of spray material application. The importance of the topic, as pointed out by Dr. Burrell, who is an outstanding authority on concentrate spraying, stems from the fact that the adoption of at least semi-concentrate spraying offers many growers their greatest single opportunity to reduce the cost of fruit production.—*Ed.*

CONCENTRATE SPRAYING FOR DECIDUOUS ORCHARDS

By A. B. BURRELL, *Cornell University*

THE TERM "concentrate" means different things to different people, but this article deals with all sprays in which more than the standard amount of chemical is used per 100 gallons. The liquid applied per tree is reduced at least as much as the concentration is increased. Often the term semi-concentrate is used where from two to five times the standard amount of toxicant is put in each 100 gallons, reserving the name "concentrate" for 6X and stronger mixtures. Others would make the dividing point 8X or 10X. In any case, the same chemicals are employed as in dilute spraying.

The machine may be specially built for concentrates, or an air-blast sprayer built for dilute sprays may be modified for the purpose. Often the only change required is in nozzles or nozzles and short pipes carrying them. An air-blast is essential, as air serves along with water to dilute the chemical and to carry it to the tree. A fine mist must be produced so the chemical may be deposited in very fine speckles over the bark, leaves, and fruits. The regular high pressure orchard sprayer is not suitable for applying concentrates, although air-blast attachments for conversion of such machines will be discussed in a later paragraph.

The importance of the topic stems from the fact that the adoption of at least semi-concentrate spraying offers many growers their greatest single opportunity to reduce the cost of production. With the same "speed" sprayer, the writer found a reduction of about one-third in man-hours and machine-hours on 100 acres of apples in changing from dilute sprays in 1947 to double concentration sprays in 1948. He found he used only about one-half the man-hours and machine-hours with 4X spraying in 1949 that he had used in dilute spraying in 1947. The added economy in changing to 6X in 1950 was less marked. The savings in time come entirely from filling the tank less frequently; any speed-up in driving would cause poor coverage. In all years, a high level of control was attained.

Determined to obtain excellent control above all else, the writer has not drastically reduced the total amount of chemical applied per tree. Since reducing the gallonage of water per tree even by one-half practically eliminates run-off, some saving in material is to be expected. Usually the gallonage is reduced slightly more than the concentration is increased.

The greatest possible saving would come with spraying when there is no wind, as often is the case at night, using a machine of adequate power to drive the spray through and above the trees, producing a very fine mist, and having the trees pruned moderately open though not open enough to cause a reduction in yield of marketable fruit.

An interdepartmental Cornell study of spraying in over 100 New York apple orchards the past two years showed highly variable results among different fruit growers using concentrate spraying. With few exceptions the concentrate machines were economical in man-hours and machine-hours, and generally they were low in total cost of materials. The control varied from excellent to poor and often not quite as good as with regular dilute sprayers. Growers tended to get somewhat similar control to what they previously had obtained with conventional equipment, emphasizing the human factor.

Some failures in these New York orchards were because the air-blast was not adequate for the particular trees. One reason some have succeeded despite a rather small air-blast is that they did the spraying when the atmosphere was quiet. The larger the air-blast, the more breeze one can buck, but the fine mists of concentrate sprays are more easily deflected by wind than are standard full-gallonage sprays.

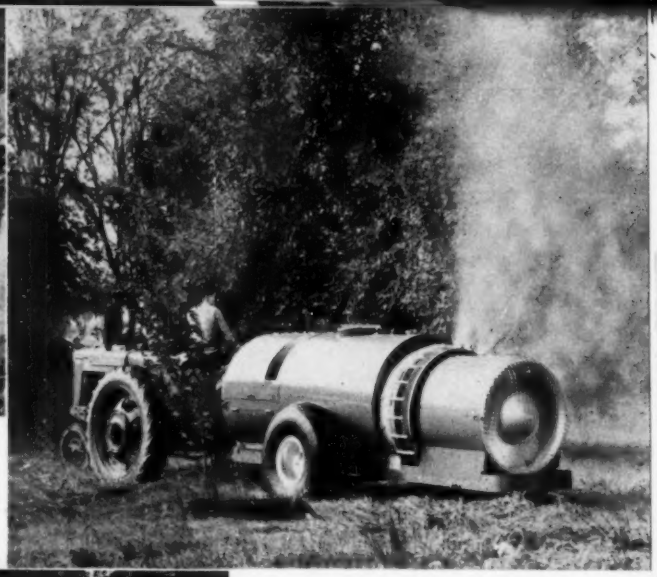
Other failures in the New York study were due to breakdowns in the mechanism. It often takes a few years to get the "bugs" out of new machinery. A few failures may have been due to too great eagerness to save material, and some seemed to be due to the grower's inexperience with a new type of machinery.

Whatever the machine, concentrate spraying requires closer observation of the deposit and greater care in application. Since the spray does not show well in the air, it often is necessary to climb the tree to study the coverage. Discretion must be used to spray heavily enough to get a fine speckled deposit on each leaf and fruit, yet not build up enough of a load by repeated treatments to cause injury or exceed the accepted tolerances at harvesttime. If the deposit is getting too heavy, the most conservative change is to reduce the amount of toxicant per 100 gallons.

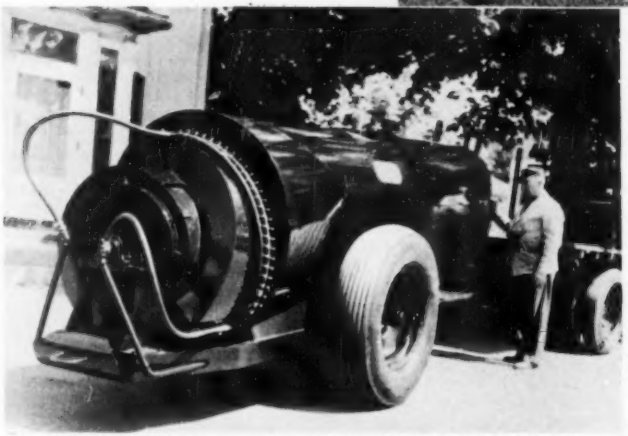
Regardless of details of design, there are a few features that all concentrate sprayers require for efficient operation. One is a speedometer, so that one may apply to each tree the exact number of gallons he chooses and so there will be slow enough forward movement for the air-blast to carry the spray through the tree. In-

(*Continued on page* 50)

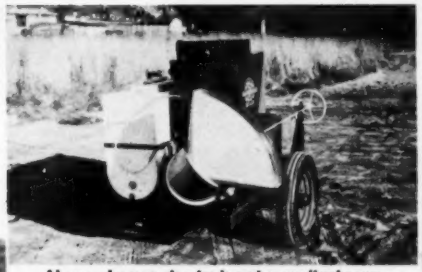
Above—Latest addition to Niagara dusting equipment is the Super Cyclone Liqui-Duster for liquid dusting or concentrate spraying. Right—John Bean Model 36-L Speed sprayer for dilute or semi-concentrate spraying offers 20 new advantages, including 26% saving on engine fuel consumption, 22% weight reduction, new system of agitation.



New SPRAY

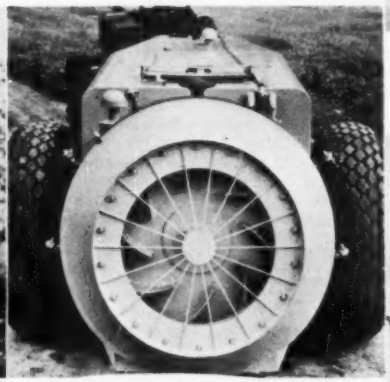


The Friend Airblast sprayer features especially designed centrifugal flow fan for uniform air pattern, oversized spray pump for long life, remote control operation of engine throttle and spray nozzle valves.

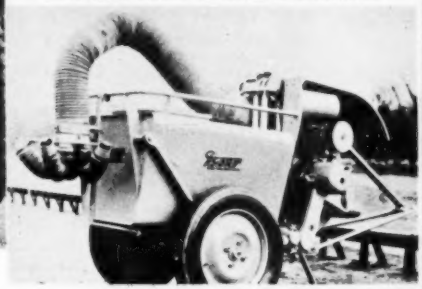


Above—Larger size tank and new diaphragm pump are available on 1951 Buffalo Turbine sprayer-duster equipment. Below—Versatile Pasteur sprayer-atomizer is the first foreign-made equipment to be introduced in the U. S. Small trees diffuser is shown in illustration.

The Hale Centrifugal dilute and semi-concentrate sprayer features new type jet agitation plus individual nozzle adjustment.



Hurst Aqua-Jet blower which converts hydraulic sprayers to air-blast is based upon an aqua-jet atomization principle.

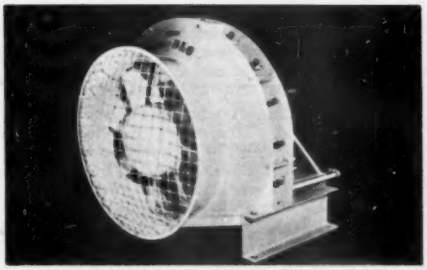


For small orchards and for spot spraying in large ones, Hudson 150-gal. Super-Power sprayer with double cylinder pump develops up to 800 lbs. pressure with capacity up to 8 g.p.m.

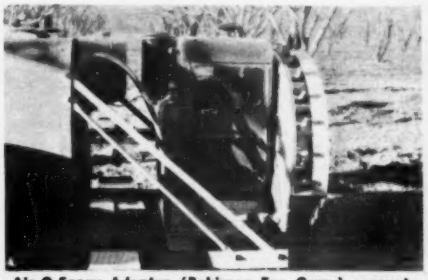
The John Bean Western Division Model 107 Mist sprayer may be used for dilute or concentrate sprays and for dusts. In photograph above it is mist spraying a peach orchard.

The Hardie Orchard Mist Concentrate sprayer has many mechanical improvements including tropical cooling and positive drive for sprayer engine plus patented backflush shut-off valve.

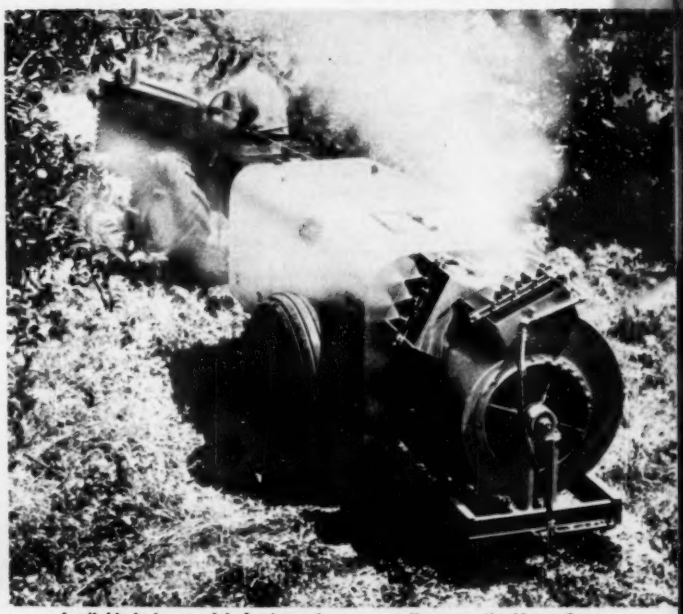
EQUIPMENT FOR 1951



New Super Model Bes-Bio blower attachment (Besler Corp.) is self-contained, delivers 25,000 cubic feet per minute. Two other models deliver 15,000 and 7,500 cfm.



Air-O-Spray Adapter (Robinson Fan Corp.) converts hydraulic sprayers to one-man operation. Directional vanes vary spray pattern according to the size of tree.



Available in two models for large trees or smaller ones, the Myers Concentrate sprayer has a centrifugal fan which delivers 26,000 cubic feet per minute at 90 m.p.h. Shown above is the model for large trees. Heads can be automatically reversed and can be split for two-side application.

Feeding Trees With NITROGEN FOLIAGE SPRAYS

By JONAS HOWARD

THE NITROGEN fertilization of apple trees is in most regions a factor which has considerable influence on both quantity and quality of yield. Many apple growers are now finding that nitrogen feeding can be accomplished more easily and with greater accuracy by the use of foliage sprays.

A forerunner in materials for use in such sprays is "NuGreen" fertilizer compound, a concentrated source of nitrogen especially developed by the Du Pont Company for application in this manner. "NuGreen" is a light green-colored semi-granular material containing 44 per cent nitrogen in the form of urea, along with conditioning agents which prevent caking and assure free flow and yet maintain high solubility. At present it is supplied only in 80-pound bags through some fertilizer manufacturers and their dealers.

Another nitrogen foliage spray compound is "Barrett Standard Urea Spray Fertilizer" made by The Barrett Division of Allied Chemical & Dye Corporation. "Ra-Pid-Gro" is also a plant food which can be used for foliage application and contains phosphorus and potash as well as nitrogen in the form of urea. It is made by the Ra-Pid-Gro Corporation.

Nitrogen foliage sprays were first made available to apple growers in the Northeast in the spring of 1949, after thorough testing by several agricultural experiment stations over an eight-year period. The initial work on this type of spray had been carried out at the New York Agricultural Experiment Station around 1940.

Readily soluble in water, they can be applied by ground-spreading or by dissolving in irrigation water. However, in the case of apple trees they offer their greatest advantages and are most often used in foliage sprays.

These sprays provide greater ease of nitrogen control, along with ease and economy of application in conventional spray equipment.

The nitrogen present in foliage sprays is quickly absorbed by the apple leaves and starts to nourish the tree immediately, regardless of excessively dry, wet, or cold soil conditions. This enables growers to regulate the supply of nitrogen to apples for optimum effects on early growth and bloom, fruit set, fruit development, and fruit coloration at maturity. This is easily accomplished in most cases by the inclusion of the fertilizer compound in three or four sprays applied during the "pink" to first-cover periods.

The demand for "NuGreen" fertilizer compound, one of the materials described in this article, is considerably greater than the supply at the moment. Consequently, it is quite possible that growers will be unable to obtain "NuGreen" this spring. However, we feel that this new development is of such importance that readers will find this progress report of great interest.—Ed.

Used in this way the spray can supply apple trees with sufficient nitrogen for the entire year. The total amount of nitrogen applied in foliage sprays for apple trees is about the same as normally used in ground applications. The better effects obtained from sprays can be attributed to a more certain and rapid absorption of nitrogen at a time of the season when the nitrogen requirements of the apple tree are both critical and great.

The foliage application of nitrogen is of further value because it can be combined with pest-control sprays now being used in apple orchards. The fertilizer compound is added to the spray tank after mixing the other chemicals. Spreading and wetting agents help to assure complete coverage of the leaves. Of course, the fertilizer compound can be dissolved in water and applied as a separate spray, if desired.

For best results, nitrogen foliage sprays for apples are begun either 1) before bloom or 2) after bloom-time, depending on varietal differences, previous fertilizer applications, and the desire for a heavier or lighter fruit set. Accordingly, two spray schedules are suggested for this period.

The "petal-fall schedule" appears most suitable for apple varieties where a heavy set of fruit is desired, and also for trees having a high nitrogen content at the end of the previous season. These applications start with the "petal-fall" spray. The addition of five pounds per 100 gallons to the "petal-fall," 10-day, and first-cover sprays usually supplies ample nitrogen for the entire year.

The "pink schedule" appears best for those apple varieties where only a medium set of fruit is desired, as well as for trees having a low nitrogen content the preceding year. Thus, nitrogen fertilizer compound used in the early "pink" and late "pink" sprays at three pounds per 100 gallons and in the "petal-fall" and 10-day sprays at five pounds per 100 gallons, will provide the year's nitrogen supply needed for rapid foliage growth and the production of high-quality fruit.

Nitrogen foliage sprays are applied with conventional spray equipment in the same manner used for

(*Continued on page* 43)

Winesaps on chemically thinned tree. Thirty minutes were required to hand thin this tree. Fruits at harvest averaged 113 per box.

Three man-hours were required to hand thin this Winesap tree 40 days after bloom. Fruits at harvest averaged 138 per box.

HAVE YOU TRIED CHEMICAL THINNING?

It Offers a Way To Get Bigger and Better Fruit At Lower Cost

By L. P. BATJER, U. S. *Department of Agriculture*

MOST apple growers have either tried chemical thinning or have heard about it. Those of you who have had first-hand experience with this practice may or may not consider it a satisfactory method of fruit thinning. If you have not used chemical thinning, it is almost certain that you are one of the many who want to know more about it.

Within the limited space of a short article it is not possible to discuss all phases of this subject. At best it will be possible only to touch briefly on certain phases of this practice which seem to be the most important considerations for anyone who may wish to employ this method of thinning.

Hand thinning of apples represents a major item in cost of production. Among other disadvantages, hand thinning cannot generally be done early enough and heavy enough to accomplish fully one of its chief purposes; that is, to avoid the tendency of the tree to more or less alternate in its bearing habit. Ultimate fruit size is also directly related to the time and thoroughness of this operation.

The chief advantages of chemical thinning when successfully performed are lower thinning cost, larger fruits, and higher yields because of heavier annual production.

There are two types of chemical thinning sprays in general use on apples; namely, the dinitro materials and the hormone-like chemicals.

Dinitro Sprays. No outstanding differences in effectiveness have resulted in experiments involving the use of various dinitro chemicals. At the present time, sodium dinitro ortho cresylate (Elgetol and Krenite) is used more extensively than the other dinitro compounds. The concentration used varies from one pint to one quart per 100 gallons, depending upon such factors as variety, tree vigor, and weather conditions. In the northeastern fruit sections dinitro-ortho-cyclohexyl-phenol (DN No. 1) is sometimes preferred to Elgetol or Krenite because it is less likely to cause foliage injury when used under certain conditions.

For best results with apples generally dinitro sprays should be applied as near the full bloom stage as possible. However, spray applications as late as one to three days following full bloom under many conditions have proved as effective as or only slightly less effective than when applied at the full bloom stage.

Hormone-like Thinning Sprays. Naphthaleneacetic acid (the hormone-like chemical used to prevent harvest

(*Continued on page* 44)

A comparison of size of Golden Delicious fruits from hand thinned trees and those thinned with two different chemicals. Tree yields were approximately the same for all three methods of thinning. The hand thinned trees the following year were completely lacking in bloom while the dinitro and hormone-like chemical thinned trees produced a commercial crop. Photograph courtesy Dr. M. B. Hoffman, Cornell Experiment Station.

THE PLUM CURCULIO

Is It Becoming a Greater Menace?

By PHILIP GARMAN
Connecticut Agricultural Experiment Station

A. L. Jenkins

SEVERAL QUESTIONS about the plum curculio seem to be plaguing fruit growers today. 1) Is the total damage becoming worse? 2) Does the insect show tendencies towards cyclic abundance or towards periods of abundance and depression? 3) Which are the best of a large number of organic insecticides offered for its control?

Answers to the first two questions are fairly simple inasmuch as we have considerable information available from years of research by entomologists and others. We do not believe curculio damage as a rule is becoming worse; neither have we been able to obtain evidence of cycling in the insect's history over a period of 20 years.

The last question is not so easy. Sufficient scientific data are not available on which to base an intelligent answer and all we can do is to tabulate the information at hand in the hope that it will be useful (see accompanying table).

The top chart on the facing page will serve as a resume of the activities of this insect. It is based on apple studies in Connecticut, but the relationship between the calyx spray which is indicated and the various activities seems to hold for other states as well.

Hyslop of the U. S. Bureau of Entomology in 1930 estimated that the fruit industry suffered a $17 million loss from the plum curculio. Since 1930, there has not been much change in amount of fruit damaged because there are always enough curculios present to produce maximum injury whenever conditions are right.

What are those conditions? And what other factors contribute the incentives which make the "little turk," as he is sometimes called, chew up the growers' fruit?

There is some disagreement among authorities as to whether post-bloom high maximum temperatures (75° F. on several successive days) or high mean temperatures (bottom chart) are more important. A high mean usually includes several high maximum days, so the two in reality are not so far apart.

To express it more simply, several hot days following bloom are all that are necessary. There, of course, are days in which the temperature rises to 75° for only a few hours and these can generally be disregarded. Whitcomb,[1] furthermore, found a progressive increase in the number of curculio punctures as the temperature rose from 65° to 75°.

These facts have meaning for the fruit grower. He can take his time if temperatures are low, but if temperatures rise suddenly following bloom, he knows he must go to work with the sprayer.

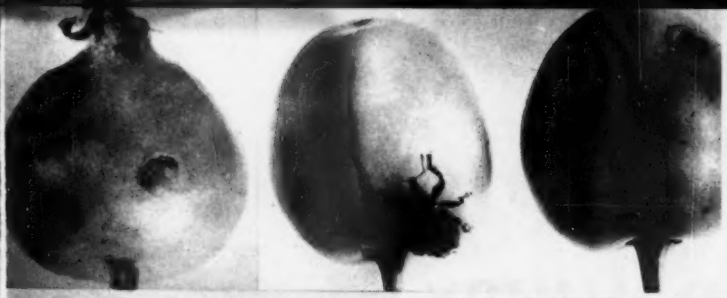
In certain years high temperatures occur before bloom. In all such years under observation damage has been light, presumably because feed-

CURCULIO CONTROL WITH VARIOUS INSECTICIDES
as of December, 1950

Materials	Dilution in lbs.[1] per 100 gals.	Cost per 100 gals.	Effectiveness	Notes
Lead arsenate	3	$0.81-0.87	Good to poor.	Standard until recently; still valuable; strong russeting on Red Delicious. Not safe on peaches in the Northeast.
Benzene hexachloride 6% gamma		$0.60-0.72	Good for larvae.	Many stings on peaches. Off flavor.
DDT (50%)	2-3	$0.60-0.90	Poor.	May bring in mites or red banded leaf roller.
DDT (50%) plus lead arsenate	2,2	$1.22	Good to fair.	Not safe on peaches in Connecticut.
Chlordane	2	$1.94	Good but variable.	Safe on peaches. Some plum varieties injured.
Chlordane-DDD Sticker	1,1	$1.48	Good on apples.	Equal to lead arsenate on apples in 1950.
Methoxychlor (50%)	3	$1.50-2.25	Good in Northeast; poor in some other states.	Apparently safe on most fruits.
Parathion 15%	1-1½	$1.50-2.25	Good	Requires frequent applications. Injures McIntosh and related apples. Excellent for peaches. Very toxic to man.
"EPN 300"	½ to 1	$0.73-1.47	Good	Reported more persistent than parathion. Slightly less toxic to man. Unsafe on McIntosh in New England.
TEPP 20%	½ pint	$0.90		Kills beetles readily, but very tempotary. Must be used frequently.
Aldrin (25%)	1	....[2]	Good.	As effective as any tried in Connecticut. Consistently good in other localities. Off flavor needs study.
Dieldrin (15%)	1	....[2]	Good.	Supposed to be as good as or better than Aldrin, one of the most powerful against curculio.

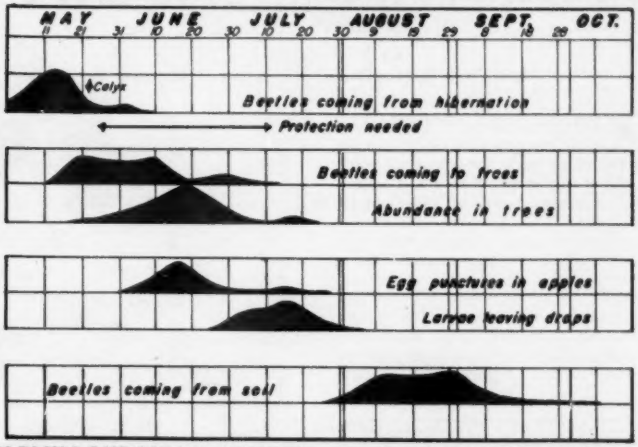
[1]Pints as noted. [2]No reliable information available to this office on cost of commercial preparations. We have been assured that it will be in line with other insecticides.

[1]Whitcomb, W. D., Mass. Agr. Exp. Sta. Bull. 285, 1932.



Top; left to right—Typical egg punctures of curculio; adult beetle, enlarged, on cherry; damaged cherry. Misshapen apple above is result of severe curculio attack.

SEASONAL HISTORY OF PLUM CURCULIO ON APPLE



The above chart shows seasonal history of plum curculio on apple. Same general history occurs in other states and chart can be made to conform by moving forward or backward on calendar according to actual time of calyx or petal-fall spray.

EFFECT OF TEMPERATURE ON PLUM CURCULIO ACTIVITY

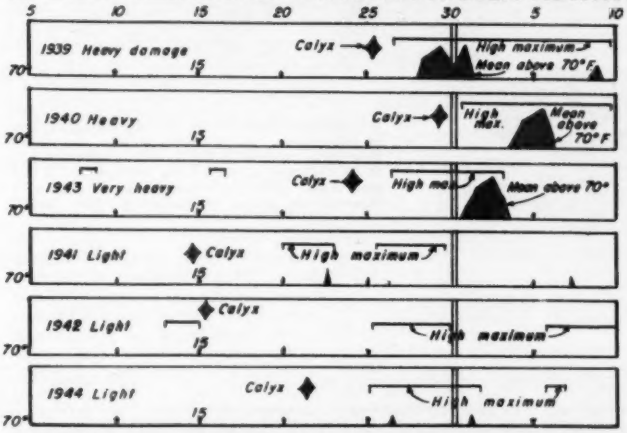


Chart based on apples showing effect of temperature on seasonal activity of the plum curculio. Diamonds indicate time of calyx spray, heavy horizontal black lines periods of high maximum temperatures (about 75° F.), blacked in portions periods when the mean temperatures reached 70° or above.

ing may be stimulated before time for egg-laying—and in consequence there has been a reduction in beetle population from feeding on sprayed foliage.

Nowadays, however, many growers are omitting poisons before bloom. We have had no pre-bloom warm spells in Connecticut since the pre-bloom insecticides went out of vogue, but some day there may be more damage than the grower likes to see if he does not recognize the importance of killing curculio beetles whenever warm weather occurs.

Damage from curculios is nearly always most severe near hibernating quarters because beetles emerging in spring will feed freely on nearby trees before dispersing to other parts of the orchard. Thick, heavy ground cover promotes easy hibernation within orchards and apples interplanted with peaches or apples near peach orchards are always damaged severely. Plums or nectarines near apples would have the same effect.

Orchards near woods are generally more severely damaged in the nearest rows, which means that attention should be given these rows with the first and heaviest applications.

As to varieties most seriously damaged, as a general rule the ones in most danger are those which first reach a size suitable for egg laying (approximately one-fourth inch diameter).

Elimination of parasites or predators is a definite possibility of the cause of increased curculio damage, but so little is known about this phase that it would be useless to discuss it at length. There are two schools of thought regarding natural enemies, one which holds that they should be completely disregarded, the other that we should

(*Continued on page 38*)

On McIntosh and related varieties activated charcoal may be the answer to

PARATHION INJURY

By E. H. GLASS
New York Agricultural Experiment Station

ALTHOUGH PARATHION is a relatively new insecticide, having been first tested in this country during 1947, it is now recognized as a standard treatment against a wide variety of insects on many crops. Naturally, fruit growers are anxious to make use of any new material that offers them hope of better control of their orchard pests.

Speaking more specifically of apples, parathion has been found effective against such important pests as plum curculio, woolly aphids, green and rosy apple aphids, San Jose and scurfy scales, red-banded leaf roller, codling moth, European red mite, two-spotted mite, and bud moth. Thus it would seem that parathion is a most valuable insecticide for use on apples, as many growers have found from actual experience.

The McIntosh apple shows severe parathion injury at mid-season. The McIntosh foliage was taken from trees sprayed with one and one-half pounds of 15 per cent parathion per 100 gallons in the pink stage; without charcoal (above) and with three-fourths pound of Nuchar C-115-N (left).

The quickness with which parathion has been adopted has varied widely in different fruit growing areas. It has been influenced by the need for such an insecticide. Thus, in the Pacific Northwest it was urgently needed for mite and woolly aphid control. In the northeastern apple section, to which I shall limit the remainder of this article, there was no urgent need for it except against the red-banded leaf roller, and even this problem was well checked by a relative of DDT, called DDD or TDE.

The 1950 season in the Northeast, however, made evident a need for an insecticide possessing the characteristics of parathion. The first four sprays immediately following bloom must control the plum curculio and early codling moth. They should also be effective against first brood red-banded leaf roller, fruit tree leaf roller, red-bug, mites, aphids and several other pests that are bothersome from time to time.

The standard lead arsenate program has proven inferior for plum curculio, red-banded leaf roller, and codling moth. Of the other insecticides that have been tried, only parathion has been shown to give satisfactory control of all the important pests present at this time. Thus we see that the apple growers in the Northeast probably could make good use of parathion in these sprays.

Unfortunately, this phosphorous insecticide has an important limitation that must be considered by many of our growers. It can cause serious injury to McIntosh, Cortland, and related varieties. Inasmuch as these varieties constitute a large percentage of the crop grown in the Northeast, we see that the use of parathion is seriously limited at the present time in this area and that a method of eliminating injury is needed.

Injury to McIntosh and Cortland varieties has occurred both to foliage

(*Continued on page* 56)

KOLODUST IN THE RAIN . . .

FOR HEAVIER HARVESTS OF FINER FINISH FRUIT

"On the nose" timing for SCAB CONTROL

Your most effective Protective Program . . .

Swift One man can Kolodust up to *50 acres* of mature apple trees in *5 hours* with a powerful Niagara Orchard Duster. The surest way to control scab is to *dust in the rain* when apple scab spores are "shooting," for Kolodust penetrates rain drops and sticks to leaves and fruit, to give lasting protection.

Safe Since Kolo materials are non-caustic, your Kolo-protected foliage will develop normally. You will benefit by larger foliage, smoother fruit finish and more fruit buds for next year's crop.

Sure Applied during scab infection periods you can time Kolodust applications *on the nose* for maximum kill of scab spores. You can Kolodust when ground conditions bog down sprayers, and obtain complete protection regardless of the severity of the rainfall. Such timeliness in application has saved many crops.

Sound Wherever scab is a problem you will find many of the best growers base their control program on *dusting in the rain* with Kolodust. The proof is in higher producing orchards and consistently better packs of fruit.

Exclusive *Non-caustic Kolodust contains Fused Sulphur adsorbed into Bentonite by an exclusive Niagara process to produce a highly penetrating dust that sticks to foliage and fruit through prolonged and heavy rains.*

Niagara INSECTICIDES, FUNGICIDES AND ORCHARD DUSTERS

NIAGARA CHEMICAL DIVISION
FOOD MACHINERY AND CHEMICAL CORPORATION

WHEN YOU BUY Niagara YOU BUY PROTECTION

MIDDLEPORT, N. Y. • Richmond, Calif. • Jacksonville, Fla. • Tampa, Fla. • Pompano, Fla. • New Orleans, La. • Greenville, Miss. • Harlingen, Tex. •
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NATIONWIDE FRUITS

PEACHES

● **Peach trees** planted in soil that had been treated with ethylene dibromide or with D-D for nematode control and that were heavily mulched annually have made notably superior growth over trees that were planted in untreated soil and were not mulched, Horticulturist G. H. Blackmon of the Florida Agricultural Experiment Station reported recently. Two years after planting, the trees in the treated and mulched soil had more than twice the trunk area of peach trees in untreated soil.

Nematodes are a serious pest in southern peach orchards.

BERRIES

● **Even the speed** of air shipment does not assure field-fresh strawberries at the market unless the fruit has been kept at 50°F. or less all along the route, the USDA at Fresno, Calif., reports. Failure to keep berries cool in transit has been the main cause of spoilage in shipments from California to midwest and eastern markets.

A lightweight, fibreboard container having a capacity of 50 pounds of berries, has recently been devised by the airlines in co-operation with the USDA at Fresno that will keep strawberries cool for 24 to 36 hours with the aid of dry ice. The fruit, precooled to about 35°, is kept cool. Carbon dioxide atmosphere produced in container from dry ice also tends to preserve bright color of fruit and delay softening and decay.

● **Strawberry growing** in the state of Washington, particularly in the northwestern counties, is normally big business, the value of the annual crop totaling around $7 million. The dread virus disease, yellows, threatened to destroy this industry. Discovery of the insect carrier of the disease, the strawberry aphid, and the use of BHC, parathion, and TEPP to hold the insect in check, are helping to restore the industry to its normal proportions.

● **Willamette and Milton** red raspberry varieties and Bristol, a black raspberry, are reported by the New York Experiment Station to be outstanding varieties for freezing purposes.

CITRUS

● **Leaf analysis** has proven fairly accurate, at least as far as potassium deficiency in citrus orchards is concerned. Leaves from fruit bearing twigs are dried, ground, and analyzed. If the potassium content is below 0.25 per cent the tree will usually have crinkled, puckered leaves, yellowing of foliage, excessive leaf shedding at bloom period, small fruit, dieback of twigs, and excessive sunburn on the south side of the tree following hot weather.

If the potassium content in the leaves is from .25 to .40 per cent of the dry matter, the element is slightly deficient and response of fertilizer is likely. If the leaves contain from .40 to 1 per cent potassium, the element is probably ample. This is the range of potash values found in healthy, high-yielding orchards.

One to 2.50 per cent potassium shows ample content; more than that indicates potassium may be excessive, according to experiments performed by Dr. H. D. Chapman, professor of soils and plant nutrition, University of California, Riverside.

APPLES

● **A simple, inexpensive** mechanical crate dumper which reduces bruising of apples 60 to 70 per cent as compared with normal hand dumping in the commercial packing plant and which at the same time speeds up handling and saves labor, has been developed by the USDA in co-operation with the Michigan Agricultural Experiment Station.

The machine consists of a pivoted crate holder supported by a rigid frame in such a way that field crates can be quickly and easily raised and dumped by means of a spring and lever arrangement. During the dumping operation the flow of fruit is so regulated that bruising is materially reduced and a continuous, uniform supply travels along the packing line.

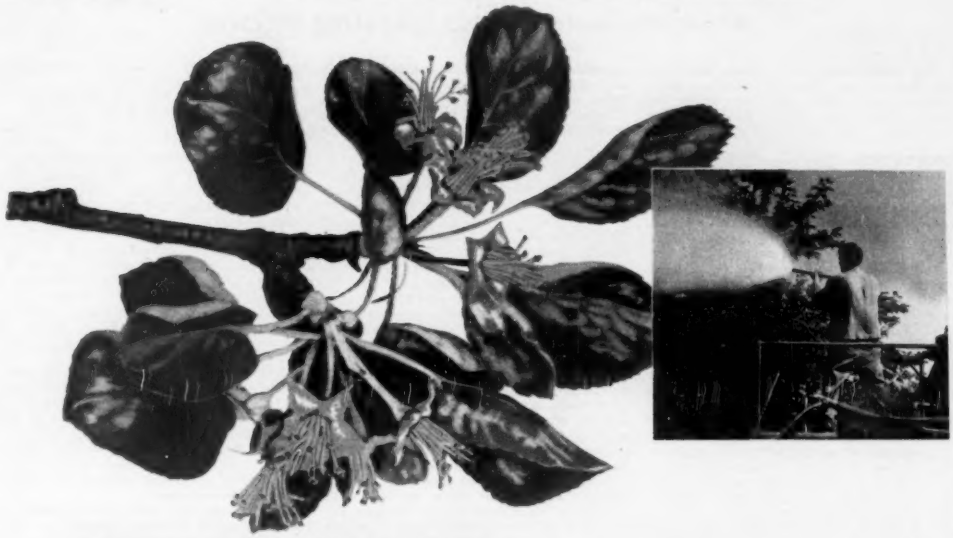
In commercial packing houses where the dumper was tested during 1950 harvest over 200 bushels an hour were dumped compared with the 100 per hour usually maintained in commercial plants.

Ordinarily, the dumper's job is a difficult one but when the mechanical aid was installed it became so much easier that the work could be performed by women.

It is believed the machine will prove of value in handling any fruit or vegetable crop that is poured from field crates to packing lines.

The device may be commercially available to packing plants for the 1951 season. A report on the device may be obtained by writing the Bulletin Office, Michigan State College, East Lansing, Mich., and asking for Article 33-23, "A Hand Operated Mechanical Aid for Dumping Fruit."

SPRAY your apple trees with Du Pont NuGREEN® FERTILIZER COMPOUND



AND GET THESE EXTRA VALUES:

- **Feed trees through the leaves.** Foliage absorbs "NuGreen" directly to build up the desired nitrogen level in the tree.
- **Get quick response.** Results show up promptly even in dry weather when roots can't absorb nitrogen from the ground.
- **Permits practical control of nitrogen** supply, for high yields of quality apples.
- **Saves labor.** Apply in pest-control sprays and do two jobs in one. Works well in both regular and semi-concentrate sprays.
- **No waste.** You feed trees exactly what they need; roots absorb the spray drip.
- **Safe for foliage and equipment.** Does not tend to burn leaves or corrode metal when used as recommended.

***This booklet** gives full details on how to use "NuGreen" as spray nitrogen for apples, and for top-dressing apples and other fruits. Gives recommended "NuGreen" spray schedules for apples. Ask your dealer for your free copy, or write:*

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*Any way you use it—*NuGREEN® *has advantages*

CONCENTRATED 44% NITROGEN, all from urea. Fewer bags to handle, fewer loads to haul, fewer stops to refill. Saves labor any way you apply it, whether used in sprays, added to irrigation water, or spread on the ground, even with hand spreading under trees.

Your dealer may not be able to supply you with "NuGreen." Rapidly expanding acceptance of "NuGreen" fertilizer compound has resulted in a greater demand than can be supplied under existing conditions. Your dealer will supply you with additional information through available literature.

DU PONT
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State NEWS

● Thanksgiving Day Freeze Hits Peaches
● Indiana Society Holds Sparkling Meeting

The sudden cold wave which blanketed the Midwest on Thanksgiving Day, 1950, caused severe injury to many peach orchards. Following are first-hand reports on the extent of the injury.

KENTUCKY—There are still sufficient buds to produce a fair to good peach crop but the status of these buds is uncertain. The three outer layers are dry and brown, subjecting the buds to severe drying out. Most serious injury probably is to the trees since the cold wave hit before they were in a full dormant condition. Nearly all have moderate to severe wood injury which is most prevalent in the trunk and lower crotches. No pruning will be advocated until after growth starts. On Thanksgiving afternoon the temperature fell 54 degrees in 15 hours to a low of —1°. This was followed by —7° the following night.—*Frank Street, Henderson.*

TENNESSEE—Temperatures in middle Tennessee ranged from 2° below to zero. An estimated 80 per cent of the Elberta buds were killed. However, little wood injury occurred. In east Tennessee where temperatures ranged from zero to 5° above, peaches were not damaged to any extent. An accurate report of injury in west Tennessee is not available. Apple injury is negligible. Where peach injury has occurred, growers are being advised to delay heavy pruning or spring applications of nitrogen until after the trees are well leafed.—*A. N. Pratt, State Hort., Nashville.*

ARKANSAS—No injuries have been reported from central and northwest Arkansas. The variable bud killing between peach varieties in northwest Arkansas was of little economic importance. No serious damage has occurred to apples, plums, cherries, grapes, and strawberries to date (Jan. 15) any place in the state. Minimum temperatures in northwest sector were 7° on November 24, 10° on November 25, zero on December 6, and 4° on December 7.—*Earl J. Allen, Fayetteville.*

LOUISIANA—No freeze injury is evident on peaches to date (Jan. 15). Temperatures are ideal for good production. Normal pruning and fertilizing practices are being carried out.—*Donald H. Spurlock, Asst. Hort., University.*

MICHIGAN—A great deal of damage occurred in southwestern Michigan on peaches, grapes, sweet cherries, and plums due to temperatures reported at 19° below zero on November 25 following a warm November. The extent of the damage, which occurred to both buds and wood, cannot be determined accurately until blossom-time. Cold injury to apples is less extensive in this area; however, there is evidence of injury on fruit spurs of Jonathan just below the bud.

Delay in pruning of those fruits showing cold injury and then only light pruning is recommended. Ample use of fertilizer is also suggested. Foliage sprays may be of value on cold-injured trees. Prof. Stanley Johnson of the South Haven Experiment Station has warned growers about the hazard of planting nursery stock with blackheart injury which might be present in young trees as a result of this sudden drop in temperature.—*Arthur E. Mitchell, East Lansing.*

INDIANA—The cold wave Thanksgiving Day dropped temperatures to zero and several degrees below. In northern Indiana 75 to 90 per cent of the buds are reported killed, with nearly 100 per cent kill in central sections. In the Vincennes area 70 to 80 per cent of the buds are believed to be dead but the remaining buds could make a fair crop. However, there is considerable wood damage which may be serious enough to cause heavy dropping of the remaining good buds. Growers are advised to delay pruning of stone fruits until after growth starts and to apply nitrogen fertilizer early to trees with possible wood damage to induce vigorous growth of unaffected parts.

Some wood injury exists on Jonathan and Golden Delicious but injury to apple fruit buds is not considered serious. Growers are advised to continue to prune apple trees but to delay pruning Winesap, Stayman, and Jonathan until danger of severe cold is past. —*Ray Klackle, Lafayette.*

ILLINOIS—A sharp drop from 35° to the zero and 10° below range caused serious damage to peach buds Thanksgiving week. The Centralia section suffered lightest kill, with a 50 per cent average. Scattered blocks in the southern counties have shown as high as 95 per cent kill. Over the state as a whole, perhaps 70 per cent of the total bud population was killed before December 1—and Illinois usually expects its heavy bud kill during January and February!

No trunk or crotch damage has been reported to date but considerable kill is expected to be evident in late spring.

After the short crop of 1950 the bud set on both peaches and apples is generally heavy. Notable exceptions are the orchards which have regularly had chemical thinning; annual production seems established in these instances and the 1951 prospect is nearly ideal.—*James N. Cummins, Dix.*

NEW JERSEY—A survey of the damage caused by the late November storm revealed that some orchardists suffered a loss of five to 10 per cent of their trees. Many have been salvaged and straightened but the extent of root injury cannot be determined at this date.—*Fred W. Jackson.*

CONNECTICUT—Prof. H. A. Rollins, head, plant science department, University of Connecticut, was elected president of the Connecticut Pomological Society at its annual meeting. Charles Bishop, Guilford, was elected vice president; H. C. C. Miles, Milford, secretary-emeritus; S. P. Hollister, Storrs, secretary; Nelson B. Cooke, Brandford, treasurer.

The meeting was held at the Connecticut Agricultural Experiment Station at New Haven, in honor of the 75th anniversary of the founding of the station, oldest agricultural experiment station in the U. S.

Highlights of the international and domestic apple situation were given by Samuel Fraser, secretary, International Apple Association. He stated that the American public with its high buying power is our best market since the average buying power of foreign markets is much lower.

Dr. Norman F. Childers of the New Jersey Experiment Station discussed the place of minor elements in orchard fertil-

(*Continued on page 64*)

In pleased discussion during their annual meeting are, left to right, Ray Klackle, secretary of Indiana society; Phil Johnson, 1951 president; L. J. Doud, past president; Dave Simpson, grower; John Bigley, 1951 vice president; and Prof. C. L. Burkholder.

THE NEW 1951 CHEVROLET

CHEVROLET

The Smart New Styleline De Luxe 4-Door Sedan

America's Largest and Finest Low-Priced Car . . . the all-around favorite of the highways and byways!

Loaded with power and really dependable!

Plenty of power! Plenty of stamina, too! Chevrolet's rugged valve-in-head engines are ready to go in any kind of weather . . . ready to meet the challenge of the roughest roads. Both the standard 92-h.p. engine and the 105-h.p. engine with Powerglide Automatic Transmission* are loaded with power and ready to go!

So economical to own and drive!

Thrift is a Chevrolet tradition. And, on city streets—or on the highways of the nation—this famous Chevrolet thrift goes far beyond outstanding gas and oil economy. For Chevrolet has long been famous for low cost of operation and maintenance. Yes, with Chevrolet, you'll find you save money *right from the start* . . . throughout the life of the car.

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Every one of the fourteen beautiful Fleetline and Styleline models has a beauty all its own. And it's beauty that lasts! Handsome, durable Modern-Mode interiors, with beautiful two-tone color harmonies, are built to stand hard wear. And the modern, new styling of Chevrolet's Body by Fisher will be in tune with the times for years.

It's no wonder Chevrolet is America's favorite, for Chevrolet is the car with everything you want. Beautiful modern styling—Thrifty operation—Unmatched riding and driving ease—Ruggedness—Dependability. Chevrolet has them all! And Chevrolet has *new* Jumbo-Drum brakes, too—the largest in the low-price field, for greater safety, greater ease of operation.

But that's just the beginning. For Chevrolet hugs the highway, smoothes out the ruts in the roughest roads. It's such a joy to ride in . . . so easy to handle . . . such a pleasure to drive!

And what a wonderful choice is yours with Chevrolet. Choose standard driving at lowest cost with Chevrolet's efficient, standard Valve-in-Head engine and Silent Synchro-Mesh Transmission. Or—choose the powerful 105-h.p. Valve-in-Head engine with Chevrolet's Powerglide Automatic Transmission*—the *only* owner-proved automatic transmission in the low-price field.

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**Combination of Powerglide automatic transmission and 105-h.p. engine optional on De Luxe models at extra cost.*

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New Taylor registering "High-Low" thermometer helps predict frost by telling highest and lowest temperatures since last setting, plus temperature now. Tiny steel-cored indicators inside tube stay put till reset with magnet. Helps locate orchards by detecting cold zones. Warns when to start smudge pots.....$10

Taylor Ship's Wheel Stormoguide helps foretell frost and local storms within next 12 to 24 hours. Much easier to use than an ordinary barometer because it gives detailed easy-to-read forecasts for each change in barometric pressure. Handsome walnut case, solid brass spokes, Stormoguide dial and exclusive altitude adjustment. $18

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TAYLOR INSTRUMENTS MEAN ACCURACY FIRST

WASHINGTON FRUIT LETTER

- **Price Controls May Affect Fruit, Eventually**
- **The Freight Car Situation Can Be Solved**
- **Delaney Committee Threat Worries Industry**

By LARSTON D. FARRAR

Washington Correspondent, American Fruit Grower

A PRICE CONTROL regulation, with teeth, was being readied under the aegis of Defense Mobilization in late January; but the most astute observers in the fruit industry here could not determine whether or not ceilings would be placed on deciduous, citrus, or other fruits by federal fiat.

Odds were considered to be against such action in view of the provisions of the Defense Production Act of 1950, in which it clearly is stated that no ceiling can be placed on any agricultural commodity that has not reflected its full parity price or has not gone higher than the highest price prevailing in or before June, 1950.

Organized fruit representatives here are hoping that no attempt will be made, at least this year, to impose a complicated formula on the industry. The memory of World War II is still fresh in their minds.

One good thing about the present situation is that any ceilings to be set must be formulated by the USDA and enforced by the price controller. In World War II the OPA set the prices after a peremptory "check" with the USDA.

ERNEST FALK, Yakima, Wash., recently appointed executive secretary of the Northwest Horticultural Council, was a visitor in Washington during January, meeting many congressmen and becoming "generally acquainted" with fruit industry representatives here.

WASHINGTON students of the transportation situation, who can still remember some of the troubles of other years, are hoping that a miracle can be performed to keep down transport difficulties and delays in the future.

They know that enough refrigerator cars aren't being built to replace the ones that wear out. Action of the life insurance companies in releasing capital to build and own cars, which they in turn lease or rent to the railroads, is credited in some circles with having helped ease the present situation and as paving the way for long-time improvement.

Also, a new two-purpose car that can double as a regular freight car or as a refrigerator car has been perfected. This car can be constructed as fast as and at no more cost than any average freight car.

Representative Walt Horan (R.-Wash.), the Wenatchee apple grower who is always ahead of the pack, has done yeoman work in recent years in striving to impress on railroad executives the importance of building more cars.

NEXT SEASON probably will not witness a renewal of the USDA buying to help stabilize the apple market, as has been done recently by the Commodity Credit Board, which controls expenditures of Section 32 funds.

Unless the new crop is even larger than the 1950 crop, it is felt here that demand will be greater than the supply due to higher incomes for virtually every average family and bigger purchases by the armed services.

THE REPORT of the committee to investigate the use of chemicals in and on food products, issued almost simultaneously with introduction of a bill to renew the life of the committee, has representatives of the fruit industry, bakers, some vegetable growers, the canners, and the agricultural chemicals industry up in arms.

In some spots the report is fair, but in most instances the organized business representatives here believe it is a curious compendium of truth and half-truth.

At one point early in the report it is hinted that a certain pesticide, as used on apples, would cause the death of persons eating the apples. Actually, the pesticide never has been used by apple growers, but this fact hardly deterred those who signed the report of the investigating group, headed by Representative James J. Delaney (D.-N.Y.).

The bill which has been proposed by the Food and Drug Administration has not yet been introduced. This proposed legislation has been labeled "fantastic" by some observers here, but it is no more fantastic than much other legislation that has been passed in recent years. What it really amounts to is a new power grab by Federal Security Agency Administrator Oscar Ewing.

THE LEADING national retail organizations have agreed to National Apple Institute requests for two more national sales drives on apples—scheduled from February 1-10 and March 1-10.

you get better control of more mites

SUCH AS:

brown mite
citrus bud mite
citrus red mite
clover mite
spruce mite
European red mite
greenhouse red spider mite
two spotted mite (including Parathion resistant)
Pacific mite
privet mite
red spider mite (Septanychus sp. on cotton)
rust mite

ON SUCH VARIED PLANTS AS:

apple
grape
plum
peach
citrus
almond
walnut
bean
nursery stock
shade trees

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ARAMITE*

THE MIGHTY MITICIDE

Recent extensive tests reveal that compared with all other commercially available insecticides, Aramite offers this broader, better control *at economical dosages.*

Consult your local experiment station for recommended dosages and spraying schedules, plus customary safety measures.

**U. S. Patent No. 2,529,494.*

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manufacturers of *seed protectants* • Spergon, Spergon-SL, Spergon-DDT-SL, Phygon seed protectant, Phygon Paste, Phygon-XL-DDT • *fungicides* • Spergon Wettable, Phygon-XS • *insecticides* • Synklor, 48E, Synklor 50W *fungicides* • *insecticides* • Spergon Gladiolus Dust, Phygon Rose Dust • *miticides* • Aramite • *weed killers* • Tufor-40.

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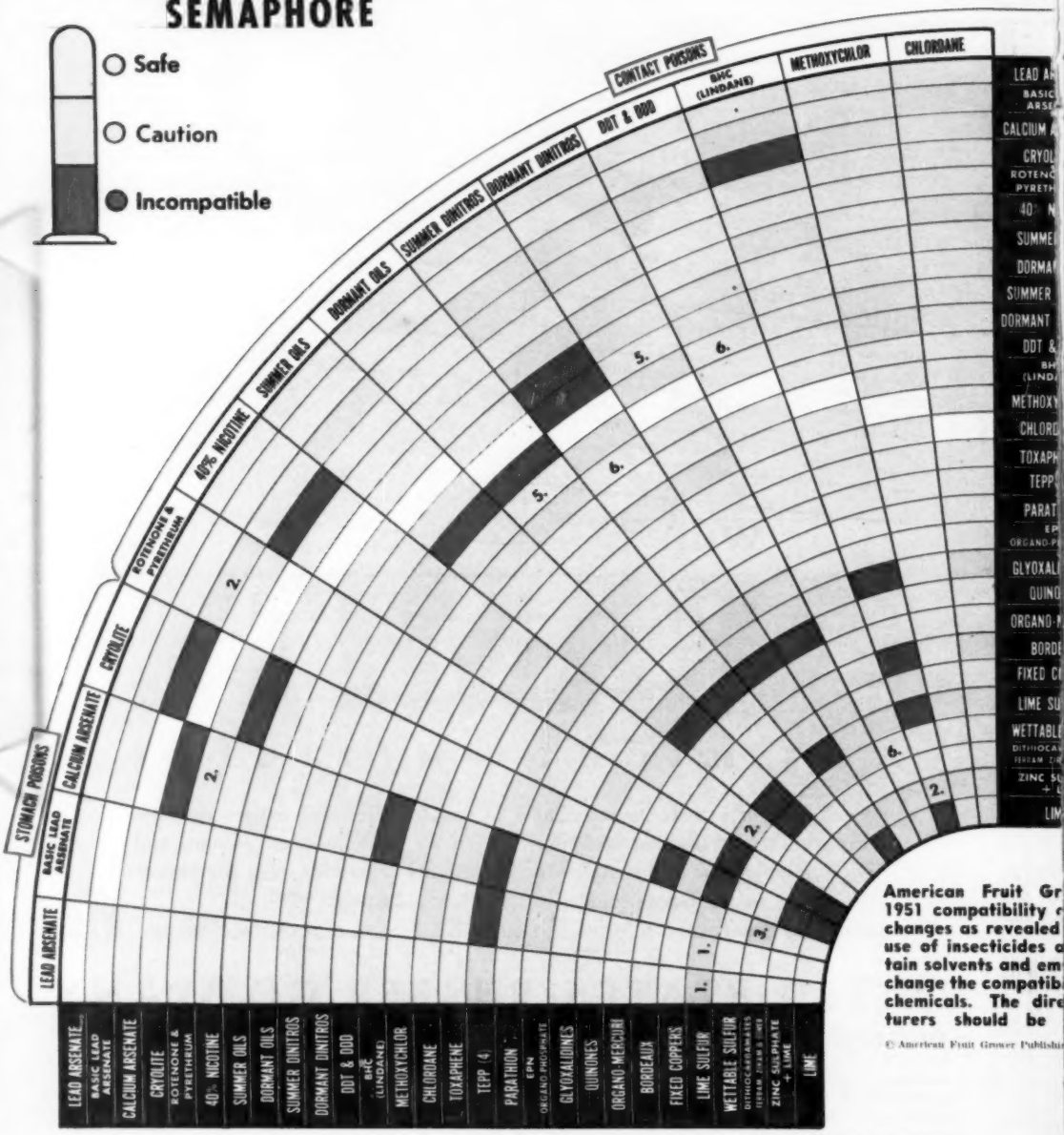
The SPRAY CONTROL SEMAPHORE



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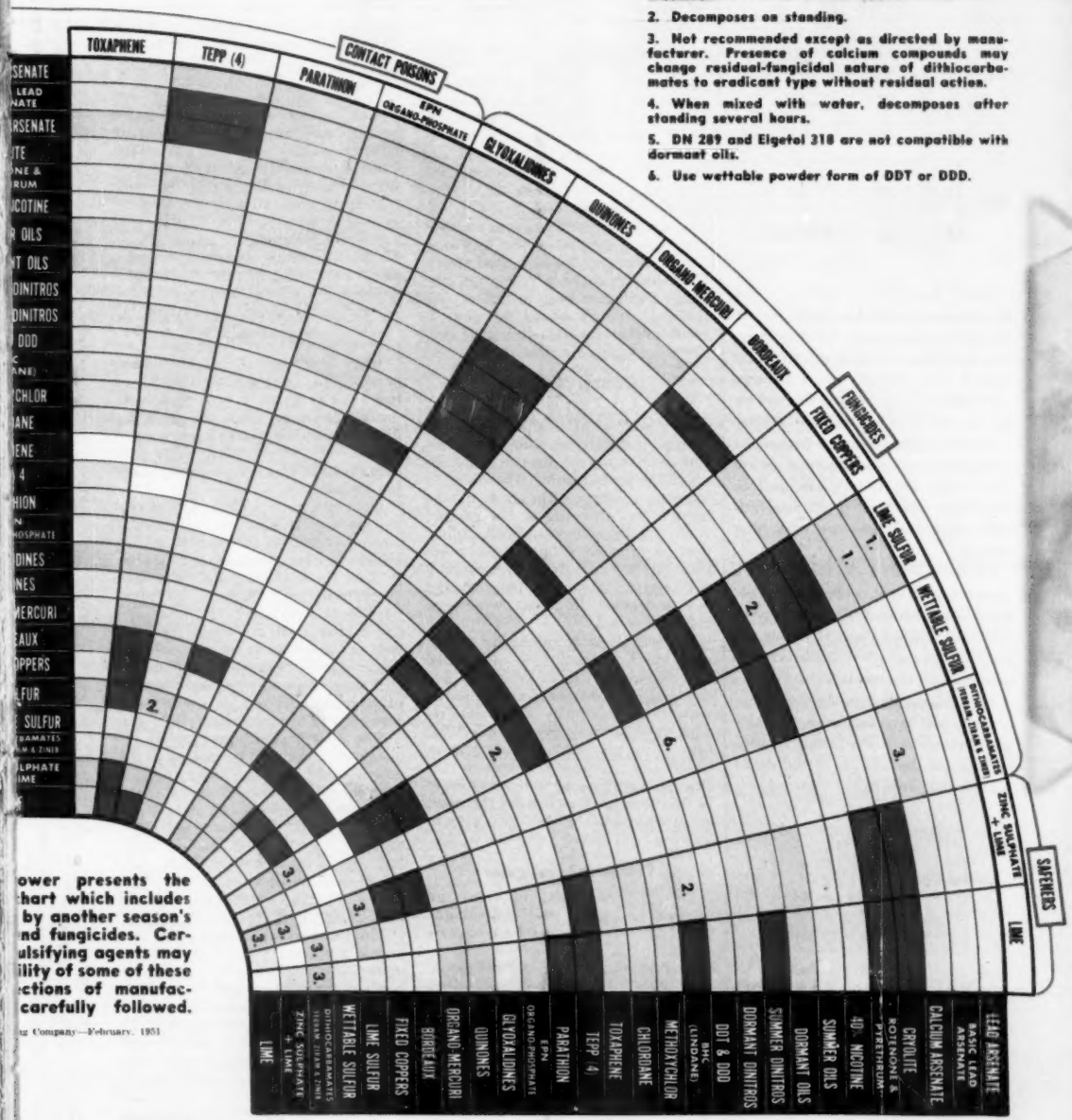

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Strawberry Growers
cut your
weeding costs

with **CRAG** HERBICIDE 1
TRADE-MARK

CRAG Herbicide 1 can help you increase your profits by controlling weeds in your strawberry beds. This new chemical weed-killer combines effective weed control with crop safety. In widespread experiment station tests conducted for the last two years, not one case of injury to strawberries was reported. Both plants and runners maintained normal growth when CRAG Herbicide 1 was used on established plantings, or on new beds when applied at least one week after setting.

CRAG Herbicide 1 effectively controls purslane, chickweed, lambs-quarters, and many other weeds. There is little or no drift hazard when CRAG Herbicide 1 is used because the chemical affects plants only through the root system.

CRAG Herbicide 1 is also being successfully used to control weeds in asparagus and sweet corn. For further information or for the address of the dealer nearest you, write to

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PLUM CURCULIO

(*Continued from page 27*)

make use of them and favor them at every turn.

So far, especially since the introduction of the chlorinated hydrocarbons, there have been several rather unfortunate experiences due partly to destruction of natural enemies and there is need of much more information on the subject than we now have.

Among parasites, 33 per cent parasitism has been observed for *Triaspis curculionis*, a small wasp-like parasite, while an egg parasite has been known to destroy 80 per cent of the eggs. Since the two parasites attack different stages it would not necessarily mean 100 per cent destruction, but the figures are impressive nevertheless.

Among the predators may be mentioned ants, ground beetles, lacewing flies and thrips, also birds and moles. Their influence as a check on curculios has never been accurately estimated, though added to what is accomplished by parasites their contribution would be important.

Control Measures

Before the day of insecticide sprays control of curculios was obtained partly by jarring the trees and destroying the beetles collected on cloths underneath. The habit of feigning death on the part of the beetles and dropping to the ground made this measure possible. Collection of infested dropped fruits before the larvae entered the ground, and clean cultivation beneath the tree to destroy the pupae, were popular at one time.

Spraying was begun in the 1880's with the introduction of arsenicals. Lead arsenate won over others because of its safety to trees compared with those previously in use, and its adhesiveness and overall effectiveness. However, lead arsenate injures peach trees seriously in the Northeast, so scientists as well as growers in this area have welcomed the newer insecticides. They certainly do less harm to peach trees.

The New Insecticides

On the other hand, many of the newer chemicals have disadvantages not apparent from the first experiments. Benzene hexachloride even in purified form gives an off-flavor to peaches. DDT in addition to being relatively ineffective for curculio may bring in mites of several species.

Chlordane is not completely safe on all varieties of plums but has given satisfaction in Connecticut for interplanted apples and peaches. Methoxychlor has to date shown variable results in different states. In the Northeast it looks good and may yet prove to be of great value. It is certainly worth trying, particularly for early fruits where there is danger of toxic residues at harvest.

Parathion, very successful for curculios in peaches, gives severe injury to McIntosh strains of apple. If it can be safened sufficiently with charcoal it should be all right for early sprays.

Aldrin and Dieldrin, two of the newer insecticides, afford much promise and appear to be about as effective as any yet tried. We have little information on off-flavor production and we know they are poisonous to man, though not as dangerous as parathion or TEPP.

Closely related to parathion is EPN 300 which controls curculio very well on peaches, pears, and quinces, but injures McIntosh in the Northeast the same as parathion.

Control Period

With any one of the chemicals, new or old, designed for control of the plum curculio, it is necessary to protect the fruit from the time the first crescents begin to appear until four to six weeks later. The first two weeks of this period are the most important.

For some insecticides, particularly the more volatile or less adhesive, it means increasing the number of applications over the number commonly used for lead arsenate. For lead arsenate the best results we have had have been with increased doses and the addition of stickers. Stickers will not necessarily work with the newer materials, but the principle is still important—that is, maintenance of a heavy deposit during critical periods and in spite of rainfall.

The ever-present question of resistance on the part of insects to the new and old insecticides has not yet been thoroughly enough investigated for curculios. There is a possibility, naturally, that resistance is beginning to show against lead arsenate and that it may show up more rapidly for some of the newer chemicals. Future investigations will have to tell that story.

The table which accompanies this article summarizes pertinent information (as of December, 1950) regarding curculio control with different insecticides. In selecting the one or ones you want to use, consider 1) effectiveness, 2) safety to tree and fruit including residue possibilities, 3) safety to the spray man, and 4) cost.

THE QUESTION BOX

Why isn't a spray schedule for peach trees adequate for quinces? I have several quince trees along with my peaches, but the fruit is never fit to use.—*Pennsylvania.*

The quince is more violently attacked by the Oriental fruit moth than is the peach, and, conversely, the peach is more subject to fungous trouble, like brown rot, than is the quince. Some peach growers are shying away from DDT because of destruction of beneficial parasites. On the other hand, quince growers find DDT a lifesaver. Although the spray programs are similar, they do not adequately converge for anyone specializing in either quinces or peaches.

How can I determine the ratio of carbohydrate to nitrogen in my fruit trees?—*Minnesota.*

Of course, a chemist could analyze the twigs and give you information on the proportion of carbohydrates to nitrogen, but the results would mean nothing without proper interpretation. However, it is possible for you to make your own analysis just by critical observation. That is, when a tree is making excessive terminal growth, it is high in nitrogen. Likewise, when a tree is making short terminal growth and when the foliage is yellowish, it is relatively high in carbohydrates in proportion to nitrogen.

The answer in the latter case is to apply nitrogenous fertilizer or to prune away some of the old wood. The answer in the other case is to reduce the application of nitrogen and to avoid pruning.

Are Golden Delicious apples in Washington subject to a reddish spot which develops about the time the apples mature? These spots first look like San Jose scale.—*Washington.*

Red coloration around lenticels sometimes appears as a result of: 1) overmaturity; 2) spray injury; or 3) sunburn.

Would you please explain the umbrella-type system of pruning grapes?—*Kentucky.*

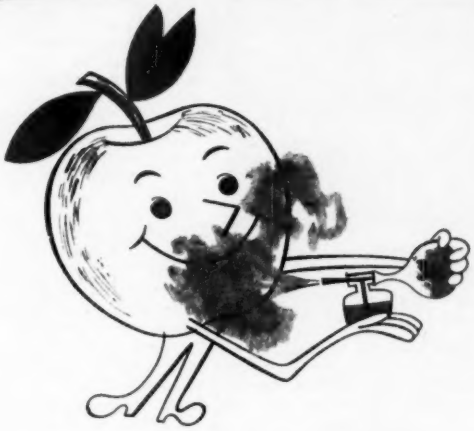
In the umbrella Kniffen system of grape training the trunk is carried to, or near to, the top wire, from the head of which canes are carried obliquely, at an angle of about 45°, to the lower wire. Usually two canes, but occasionally four, and sometimes three (two on one side of the trunk and one on the other), are used.

The formation of a Y-terminal of the trunk slightly below the upper wire permits the canes to be more readily bent without breakage. Also, the canes may be carried over the top wire and then downward. When three wires are used, the central wire is erected a little nearer to the lower wire than to the upper wire.

What is the best way to clean out a pipeline after spraying with DN-289?—*Massachusetts.*

Use a solution of sodium carbonate in hot or warm water. This solution is prepared by using one pound of sodium carbonate to approximately 10 gallons of water. The sodium carbonate should be allowed to dissolve and the resultant solution circulated throughout the system and allowed to stand overnight, if possible.

No Scab on me!



If apples could talk, that's what you'd probably hear. After all, no self-respecting apple likes to get apple scab, and no grower likes to have his apples get it either. You sure can't make money with scabby apples.

Why not protect your apples—and your profits—with CRAG Fruit Fungicide 341? It's an easy-to-use liquid. No spreaders or stickers are needed and this fungicide is compatible with most commonly-used insecticides.

Ask for CRAG Fruit Fungicide 341 next time you're buying spray materials. It can do a good job in *your* orchard, too.

protect for profit

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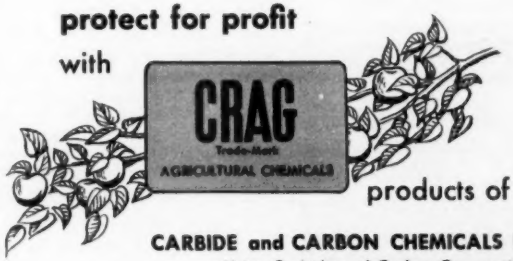

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From Pre-Pink to Harvest— a Sulphur for Every Purpose

Magnetic "70"
Concentrated Sulphur Paste

Unquestionably the "Cream of the Sulphur Pastes." It pours . . . It sticks . . . It protects. Fineness—under 2 microns surface average diameter. Try it this year in pre-bloom, blossom and calyx sprays on apple and for blossom and early cover sprays on cherry and peach.

Magnetic "95"
Microfine Wettable Sulphur

Our finest dry-wettable sulphur for use in early cover sprays on apple, peach and cherry. Use it also as a dust during rain.

Magnetic "90"
Microfine Dusting Sulphur

Surface average diameter under 5 microns. Great as an in-between-dust in a spray program or for use on wet foliage or in the rain.

"Magnetic Spray" Wettable Sulphur

Safe, effective, ecohomical. Particle size under 8 microns surface average diameter. Remember "Mag Spray" if you use a Wettable Sulphur in your summer spray schedule.

"Crown" Brand Wettable Sulphur

For superior color and finish use "Crown" Brand in your pre-harvest sprays on Peach, Cherry and Plum . . . Not too fine, not too coarse.

"Perfection" Dusting Sulphur

Its free-flowing, non-alkaline characteristics make "Perfection" Dusting Sulphur *perfect* as a pre-harvest dust for Cherry, Plum and Peach.

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ORCHARD INSECT CONTROL

(*Continued from page* 15)

operators. Some of these materials show great promise, and we are sure to hear more about them in the near future.

"Systemic" Insecticides

Certain of the phosphorous materials act to some extent as "systemic" insecticides. When applied to a plant in the usual way, or to the soil about the roots, a "systemic" insecticide penetrates into the plant, moves around in the sap, and in some way makes the plant poisonous to insects. Entomologists have long dreamed of controlling insects in this manner, and recent developments suggest that such dreams may in time be fulfilled. The chief encouraging results obtained thus far have been in the control of mites and aphids on cotton and on some other rapidly growing, succulent plants.

It will be a long time before the possibilities of such materials on fruit trees will have been fully explored. One big advantage of a "systemic" insecticide would be that it could be used without interfering with the activities of the natural enemies of the pests to be controlled. If such materials are found effective on fruit insects, it will be necessary to determine the effect of such treatments on the health qualities of the fruits from orchards thus treated.

Some New, Promising Materials

In the control of orchard mites a number of materials are giving good results in one locality or another. Among these may be mentioned EPN, Karathane, Dimite (DMC), and Aramite. There are also several promising experimental materials that are known thus far by code designations.

Although of considerable value against the plum curculio, benzene hexachloride seems to have a doubtful future in peach spraying. The ordinary grade of benzene hexachloride often imparts a flavor to the peaches that appears after the fruit has been canned. This has occurred in some cases with the use of benzene hexachloride restricted to early applications. The more highly refined forms of benzene hexachloride, such as lindane, are less likely to cause off-flavor, but when compared on the basis of equal content of the "gamma" isomer, the most active part of benzene hexachloride, the pure form seems to be less effective in curculio control than the technical grade.

Among the other promising materials are aldrin and dieldrin, which seem to be very effective in the control of the plum curculio and other insects on peach.

Dozens of other new products are in various stages of development and testing, and a full discussion of them all is out of the question, as it would fill this whole issue of AMERICAN FRUIT GROWER. As time goes on, many of these will disappear, and others will be brought into the experimental picture. Eventually the best of them will find their place in the orchard spray program, and give more effective, safer, or more economical control. Ideal materials will combine all these features.

Natural Insect Enemies

We are realizing more and more, as the new insecticides are coming into use, that natural enemies have been giving us a great deal of help in controlling many of our insect pests, and that this help is lost when some of the insecticides, especially the newer ones, are used. This doesn't mean that if the use of insecticides were entirely discontinued the natural enemies would in a few years give adequate control.

The so-called balance of nature would never suit a fruit grower or city consumer, as observations in any

HANDY ANDY

Fruit grower Ralph LaPierre, Hillsborough County, Greenville, N. H., believes in plenty of mulch around his fruit trees; but swinging a scythe in his 85-acre apple orchard is a thing of the past. He finds a tractor mower attachment is mighty handy to go down between the rows and he has also bought a small two-wheeled power mower with a short cutter bar in front. He claims it's just the thing as it swings around easily when clipping close to the trunk. And the best part of it is that Ralph can stay in the shade on a sweltering hot summer day and still get his work done.—Charles L. Stratton.

long-abandoned orchard would show. Nature likes worms as well as she does perfect apples, and is impartial about the whole thing. However, natural enemies of insect pests are often very helpful in control if the use of insecticides and other orchard practices does not interfere with these enemies too much. The way in which the greatest benefit may be secured remains to be worked out.

Spray Material Application

Along with the new insecticides, new devices for applying them are fast developing. Driven by the need to lessen labor costs, growers have for several years been trying various new types of spray equipment. The "speed" type of sprayer, in which the liquid is driven into the tree by a powerful blast of air, is now standard equipment in many orchards. Numerous other types of sprayers have been developed with the same objective in mind—rapid application of the insecticide with the least possible use of manpower.

The earlier sprayers of this general type used the same quantities of water as the former conventional types of hydraulic sprayers. Much work is now under way with sprayers equipped to handle more concentrated spray mixtures—mostly four to eight times as strong as formerly—with a corresponding or greater reduction in the amount of water.

If DDT 50 per cent wettable powder was used formerly at a strength of two pounds per 100 gallons, 25 gallons per tree, it can be used in the newer equipment at eight pounds per 100 gallons, six gallons or less per tree, or 16 pounds per 100 gallons, three gallons or less per tree. The DDT solutions, as successfully used for certain shade tree or forest pests at a pint or so per tree, have not worked out so well in the control of orchard pests.

There are wide differences of opinion on the most desirable features of the newer types of machinery. For instance, some workers are convinced that high air volume (15,000 cubic feet or more per minute) and low air velocity (90 to 100 miles per hour) are essential; others are sure that low air volume (5,000 to 10,000 cubic feet per minute) and high air velocity (150 miles or more per hour) will give the best results. In this connection, "high" and "low" are relative terms having little relation to their usual meanings.

As with the new insecticides, spray equipment is in a period of rapid transition. However, we can be sure that the ultimate result will be more efficient and practical machinery for orchard pest control.

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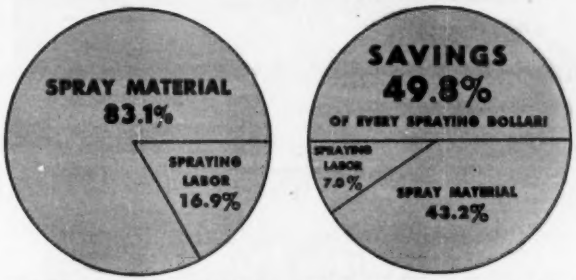
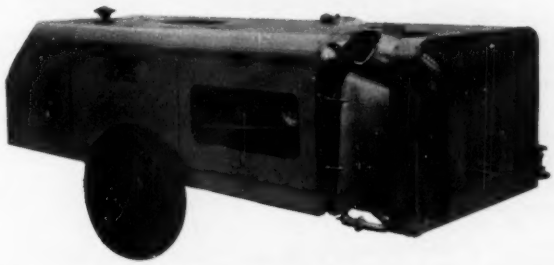


ORDINARY SPRAYING METHODS cost you material, time, labor and money.

FARQUHAR MIST SPRAYING assures complete coverage at a saving of almost 50%!



Now orchard and grove operators can get complete coverage at less cost with Concentrate Spraying . . . use lighter equipment . . . with this sensational one-man Iron Age Orchard Mist Sprayer!

Look at these Farquhar features! Double axial blowers allow efficient spraying from either side. High-speed air blast insures complete coverage. Special discharge orifices direct proportionate volumes of air at uniform velocities to top and bottom branches. High pressure break-up assures right droplet size. Light weight permits early spraying on soft ground.

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SPRAYING SPELLS SUCCESS

(*Continued from page* 16)

more to it than that. Mr. Moore watches his books, his trees, and the weather. His spraying program is in many respects an exact science.

The foundation of the spray program—proper pruning of the 1,150 trees in the 30-acre orchard—is begun early in the year.

"We have learned to prune heavier than we used to," Mr. Moore said. "Also, we don't let trees get more than 16 to 18 feet high. Not only is the fruit costly to pick on tall trees but the upper-center of the trees is difficult to spray.

Pruning usually is completed in March and preparations are made for spraying. A 650-gallon Bean sprayer with two brooms of eight nozzles each is used. One sprayman rides on the top of the sprayer, another on a low, rear platform, so that the spray is thrown both downward and upward. About 600 pounds pressure are used.

Water for spraying is conveniently stored in a 1,000-gallon supply tank at one corner of the orchard. A rotary pump powered by a gasoline engine lifts the water from a nearby township ditch.

On March 20, 1949, Mr. Moore made the first attack of the season on his orchard enemies . . . red mite, San Jose scale, scab, curculio, leaf roller, and codling moth. A total of 11 sprays was applied during the season. DDT was used in the last three cover sprays. The final mopping up drive was on August 5, when parathion was used for red mite.

In 1950 the first spray was applied on April 22 and the final spray, mostly on Jonathan and Golden Delicious, on August 8. No contest was worked out by the experiment station in 1950 but several state men who visited the orchard found the percentage of clean fruit was just as high as if not higher than in 1949.

The amount of spray used was increased as the season advanced. It also has increased over the years.

He pointed out that a spraying program must vary in different localities. General schedules are helpful but they must be altered to fit individual requirements.

Although realizing the importance of sanitation in controlling insects, Mr. Moore warns of the danger of "burning off" orchards where the orchard is mulched. Not only does the fire endanger the trees, but such practice results in loss of valuable mulch.

A Family Proposition

The Moores bought their 200-acre farm in 1918. Snow drifted through cracks of their log house and had to be swept out. A new home was built the following fall and winter.

At first Mr. Moore, whose father grew peaches, helped relatives on a fruit farm. In 1925 he went into business for himself.

For himself and family, that is. Fruit growing with them has been a family affair. His wife and seven children have helped. A daughter, Mary Jane Henry, and sons Archie, Howard, Ralph, and Richard are married, but none lives more than five miles away. Earl also is married but lives at home as does Charles.

"A factor in the success of this orchard is the common interest in it by both father and sons," Dr. C. R. Cutright, associate entomologist, Ohio Agricultural Experiment Station, Wooster, declared. "This factor cannot be measured, but it is of definite importance to the life of the orchard."

About 20 persons usually help the family to pick, haul, grade, pack, and truck the fruit. The grader and delivery hoppers used in the Moore orchard were invented by Mr. Moore.

Mr. Moore emphasizes he can't take much credit himself for his measure of success. But as one watches the blemish-free fruit come down the belt, he gets the impression that here is an orchardist who really gained knowledge on how to grow quality apples.

FOLIAGE SPRAYS

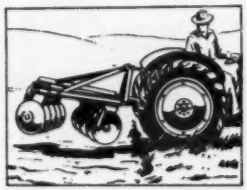
(*Continued from page 24*)

pest-control applications. Many growers use high-pressure hydraulic sprays with either the broom or gun-type nozzles, whereas others favor use of air-blast equipment. Complete coverage of the foliage is just as important for the fertilizer spray as it is with pest-control sprays.

To date, most research work has involved spray solutions of standard concentration applied to mature apple trees at rates of 15 to 20 gallons per tree. In these the nitrogen foliage spray is used at three or five pounds per 100 gallons, depending on when it is to be applied. Some preliminary work has been done in 8X concentrate sprays, but additional tests are needed before recommendations can be made. A few trials in 2X and 4X semi-concentrate sprays, applied with air-blast equipment, have appeared satisfactory. However, such concentrations are still definitely in the experimental stage.

The use of foliage sprays for other agricultural crops has many possibilities. Greatest interest exists in those regions where foliage sprays are now used for crops which can benefit from a regulated nitrogen fertilization program. Extensive tests are under way, and recommendations for these additional crops will be made when testing has been completed.

This Disc "Rides" to the Orchard ..."Adjusts" to Cut or Level!



This great Dearborn Lift Type Tandem Disc Harrow is a real "Partner in Production." It "rides" to the orchard in lifted position, eliminates road wear on the blades—as your Ford Tractor sprints to the job. No transport wheels to complicate the harrow design or increase its price!

This disc helps you avoid spring delays, by lifting over wet spots. A quick flick of Ford Tractor Hydraulic Touch Control lever raises and lowers it to miss a rock, cross a grassed waterway, give you speedy turn-arounds. And this staunch Tandem, with the 20° fixed angle, does orchard tillage to order.

Besides, this quick-attached tool has other advantages for less modern discs to envy! (1) You can raise rear gangs, increase weight on front gangs, to cut trash better, improve penetration. (2) You can raise front gangs, giving rear ones bigger dirt moving capacity to level and smooth row centers. Get all the facts. Believe your eyes!

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END MAN-HOUR WASTE!

for ONE-MAN OPERATION

Adjustable BUTTERFLY PATTERNS

The patented design of the AQUA-JET Boom HEAD is a common sense way to stop wasting power-sprayer pressure. The discharge from the Aqua-Jet continues at high-velocity after the twin streams impinge (or atomize) outside the nozzle. The finer particle size and the unique air-draft created gives longer reach and better spraying than any ordinary nozzle. Full hydraulic control from the tractor seat assures ONE-MAN OPERATION and lowest cost orchard spraying.

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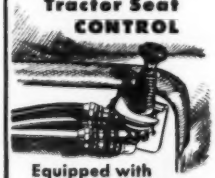
plus Instantaneous FINGER-TIP Tractor Seat CONTROL



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Its g.p.m. capacity is_____

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Tree height is_____ feet

Spacing between rows_____ feet

Kind of trees_____

Eastern Distributor: NEWTON CHEMICAL & SUPPLY CO., Bridgeville, Delaware

CHEMICAL THINNING

(*Continued from page 25*)

drop) is an effective thinning agent for apples. For greatest freedom from foliage injury this spray should be applied two to three weeks after petal fall. The concentrations of naphthaleneacetic acid that have been found most appropriate for thinning apples range from 10 to 20 parts per million.

There are at least two advantages of the hormone-like thinning spray over the dinitro blossom spray: 1) The amount of fruit set and the necessity for thinning can be determined to some extent before the spray is applied. In the case of a dinitro spray it is necessary to assume that fruit set will be heavy. 2) In some areas the danger of killing frosts is still a possibility after dinitro sprays have been applied. This danger is largely over by the time hormone-like thinning sprays are used.

The choice between naphthaleneacetic acid and the dinitro materials as a thinning agent for apples will depend upon a number of factors such as fruit section, variety, and numerous environmental conditions. In the Northwest the dinitro materials have proved more consistent in effect and more satisfactory than the hormone-like sprays, while in certain midwest and eastern sections the reverse has been true.

Variety Adaptability

In general, chemical thinning can be used with greater safety and dependability of results with varieties that tend to set heavy crops. This group includes such partially self-fruitful varieties as Yellow Transparent, Wealthy, Jonathan, Golden Delicious, Rome Beauty, Baldwin, York Imperial, and Yellow Newtown.

Self-unfruitful varieties (those that require cross-pollination) are more uncertain in their fruit setting habits, and whether thinning sprays can be safely applied will depend upon such factors as provisions for cross-pollination, weather conditions prevailing during the bloom period, and tree vigor.

Under favorable conditions in the Northwest, Winesap and Delicious are successfully thinned with dinitro sprays. Under conditions prevailing in midwest and eastern fruit areas, these and other self-unfruitful varieties are not generally considered adapted for chemical thinning.

How Thinning Sprays Reduce Set

In order to understand better the relationship of factors affecting results with thinning sprays, it is essen-

tial to have some knowledge of the action of these sprays in reducing fruit set. Dinitro sprays reduce fruit set by direct action as a pollenicide on unfertilized flowers, and they also may prevent many of the fertilized flowers from developing indirectly through tree "shock" or temporary alteration of growth processes.

By action as a pollenicide is meant that pollen germination is prevented when the spray material is applied to the stigmatic surface of the flower prior to, or shortly following, pollination. Thus, by direct action as a pollenicide the spray tends to prevent freshly opened blossoms from setting fruit and spares the older blossoms that have been pollinated some time before the spray application.

Reduction in Fruit Set

The fact that appreciable set reduction is obtained when dinitro sprays are applied from one to three days following full bloom would indicate that a large number of flowers already fertilized are prevented from developing fruit by the action of the spray material. It is believed that under many conditions reduction in fruit set is not only due to the dinitro acting as a pollenicide or as a direct casual factor, but that the spray prevents many of the fertilized flowers from setting indirectly through tree "shock," or temporary alteration of growth processes.

Extensive observations indicate that this indirect type of thinning is more prevalent during cool, humid bloom periods, or when trees are lacking in vigor because of imperfect soil drainage, winter injury, inadequate nutrition, and other types of trouble which interfere with normal tree functioning. Even though a heavy fruit set is destined to occur under these conditions, it is likely to be a "weak" set and therefore vulnerable to the indirect action of dinitro thinning sprays.

No definite explanation of the physiological effect of hormone-like sprays in reducing the set of apples has as yet been offered. It is definitely known, however, that the spray is selective in its action and tends to eliminate the type of fruit that is likely to develop into low grade apples at harvest. Thus, fruits that are borne on weak fruiting wood and fruits that have a low seed content due to imperfect fertilization are the most susceptible to the action of these sprays.

There appears to be considerable similarity between the action of hormone-like sprays and the indirect action of dinitro sprays. In other words, the degree of tree vigor and the environmental conditions that favor

(*Continued on page 46*)

Revolutionary NEW AQUA-JET BLOWER

ATTACHABLE *to any make or type of high pressure sprayer*

DOWN TO 4 GPM Per Side
. . . designed especially for use with concentrates or semi-concentrates.

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Atomization occurs outside (in space) the 6 Aqua-Jet Heads. Pump pressure is converted to long projection instead of choke loss. Jet tips are renewable and interchangeable. 11 different capacities available.

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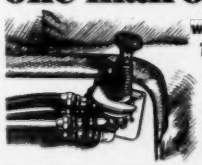

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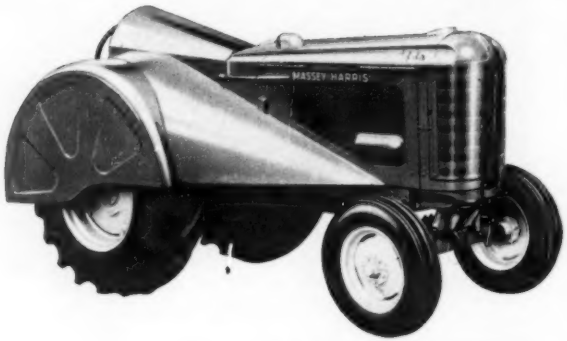

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Make one trip through your orchard with the Massey-Harris 44 Orchard Tractor and you'll understand why it's such a favorite with fruit growers everywhere!

You'll find the No. 44 especially easy to handle. Its narrow tread lets you get in between trees . . . make short turns. Low center of gravity insures greater safety and stability on hillsides. Complete shielding and lack of objectional projections lets you get under low hanging branches without damage to crops or danger to the driver. Shock-resistant steering, hand-operated clutch assure perfect control.

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Once you have the complete story, you'll see how a Massey-Harris 44 Orchard Tractor will fit into your fruit producing operations and help you do a *better* job of caring for your orchard or grove . . . faster, easier, more economically.

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CHEMICAL THINNING

(*Continued from page* 45)

heavy thinning with hormone-like sprays also result in a high degree of indirect thinning when dinitro sprays are used.

Factors Affecting Results

Weather Conditions. The successful use of thinning sprays is based on the assumption that fruit set will be heavy. During the past several years it has become increasingly evident that weather conditions existing during the bloom period are perhaps the most important single factor in determining the success of thinning sprays.

The 1948 bloom season in central Washington was characterized by cool, humid weather. During the seven-day bloom period there was a daily average of 65 degree-hours above 50° F. During this season about 3,000 acres of apples in central Washington received chemical thinning sprays. Orchards with adequate pollination and good tree vigor were effectively thinned. However, there were several instances of overthinning under conditions of inadequate pollination and low tree vigor.

With respect to weather, the 1950 bloom season was in decided contrast with 1948. During 1950 the weather was dry and warm, with a daily accumulation during a seven-day bloom period of 230 degree-hours above 50° F. Approximately 15,000 acres were sprayed under these conditions without a single instance of overthinning reported. Practically all growers using the sprays received substantial benefits but some were disappointed because of insufficient thinning.

Even though a heavy set may occur during a cool, humid bloom period, thinning sprays are more likely to thin heavily (principally because of greater indirect action of the spray) than in seasons when generally warm, dry conditions prevail.

Pollination and Bee Activity. In areas where self-unfruitful varieties are chemically thinned it is extremely important that consideration be given to provisions for cross-pollination. The number of pollinizers needed to insure a heavy set will vary with weather conditions.

With good weather prevailing during the bloom period self-unfruitful varieties should set heavily five to six tree spaces away from a pollinating variety provided there are sufficient bees or other pollinating insects. Under adverse weather conditions pollination may become a limiting factor when self-unfruitful varieties are lo-

cated more than one tree space distant from a pollinizer.

For greatest safety thinning sprays should not be used under conditions where pollination is likely to be a limiting factor.

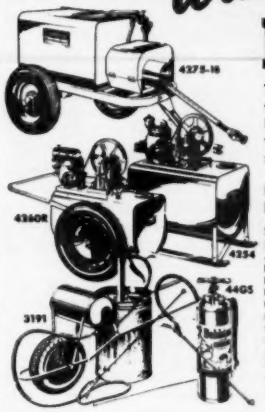
Tree Vigor. Overthinning is less likely to occur when thinning sprays are applied to trees in a normal to above average state of vigor. Trees are more susceptible to the action of these sprays when in low vigor as a result of growing in imperfectly drained soil or suffering from various types of root trouble, winter injury, insufficiency of nitrogen, a deficiency of sunlight, or any other trouble that may affect normal functioning of growth and fruit setting processes.

Fruit set on trees affected by any of the above conditions is frequently lower than on normal trees. Experimental evidence and repeated observations with trees of this type indicate that thinning sprays may result in reduction of fruit set beyond the point of an adequate commercial crop. Overthinning is probably the result of a much greater indirect or "shock" effect from the toxicant (when dinitro sprays are used) than usually occurs on normally vigorous trees.

It should not be concluded that weak trees preclude the possibility of using thinning sprays. If heavy fruit set can be depended upon it is likely that lower than conventional concentrations might prove safe and effective. In order to proceed safely, however, it would be necessary to conduct trial tests.

A WORD OF CAUTION

Chemical thinning is not foolproof and for this reason cannot be universally recommended. However, it should not be assumed that this practice is still confined to an experimental basis. On the contrary, chemical thinning is being used commercially on an ever-increasing scale where conditions permit. Growers who have had experience with fruit thinning sprays are generally enthusiastic over the benefits of greater fruit size and heavier annual production. A fruit grower using these sprays for the first time should by all means consult his local experiment station or county agent. A great amount of useful information is available but it remains for each grower to evaluate these sprays under his own particular set of conditions. Like a person learning to swim, one cannot become proficient by merely listening to instructions; he must plunge in and get his feet thoroughly wet. However, until one has mastered the art it is advisable to proceed with judicious caution; otherwise there is danger of drowning.



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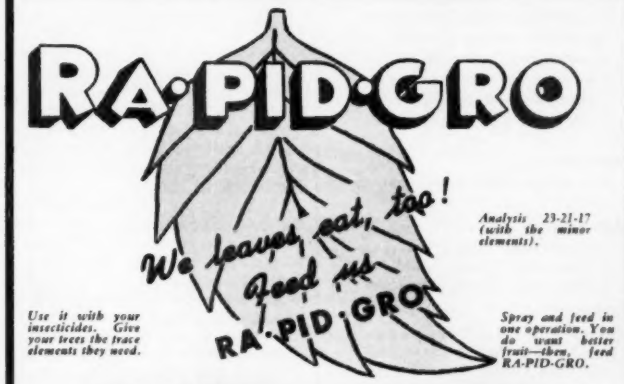

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Elimination of scab means a bigger crop, better fruit, more vigorous trees. Use Puratized Agricultural Spray to guard against infection and to inactivate scab after it starts.

The outstanding effectiveness of Puratized Agricultural Spray has been proven year after year by commercial growers everywhere.

This patented formulation is recognized by research authorities as a unique contribution for the control of scab and other plant diseases. Consult your local dealer or write today for further details.

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One gallon makes 800 gallons of spray.

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Instantly water soluble. Leaves no visible deposit. Can be applied with common insecticides and fungicides.

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Effective, too, for brown rot blossom blight of cherries and peaches, and certain other plant diseases.

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NEW SAFETY DEVICE FOR HANDLING PARATHION

By JOE CROSBY

A FOOLPROOF device which permits the new wonder insecticide, parathion, to be placed in a spray rig with complete safety to the operator, has recently been invented by a California citrus grower.

Outstanding feature of the little unit is that it allows the user to put the potent chemical into a spray tank without coming in contact with the material. In addition, the insecticide is cleaned automatically from the container, thereby removing any possibility of injury being sustained from packages which are supposedly empty.

Dr. A. M. Boyce, chief entomologist at the University of California Citrus Experiment Station, Riverside, says the "chamber," as it is called, is the safest and best method of getting the material into a spray rig that he has seen. He is hopeful that the general principle involved can be used for other types of potent insecticides as well.

Idea for the safety gadget was conceived by Joy Jameson, Jr., manager of the big Jameson citrus ranch at Corona, in southern California. He has had seven of the units built in his ranch shop and has installed them in various pieces of spray equipment.

How the "Chamber" Works

Mounted on the top of a spray tank, generally behind the manhole, the cylinder-type chamber works on the principle of an oil-can opener. As the parathion container is set in place and the chamber is closed, two pieces of pointed pipe punch holes in the top and bottom of the can.

High-pressure water flowing from the spray rig into the chamber forces all of the parathion out of the can in 10 seconds. Since the whole thing is sealed there is only one direction in which the parathion can go—down into the spray tank.

Simple to Construct

The gadget is so simple that anyone who is handy with a cutting torch and welding outfit won't find it hard to build one in two or three hours. However, there is one requirement that must be met to make it work; namely, the parathion must be packaged in cans. Jameson induced a manufacturer to put up parathion for him in one-gallon cans, like those used for paint.

The housing for the chamber is made out of a piece of eight-inch O.D. pipe, slightly longer than a one-gallon paint can. A metal cap is welded to the bottom of this cylinder. Extending through this bottom cap is a piece of inch and a half pipe, cut to a 60-degree angle at the top. A hole is at the base of the pipe so that as the parathion can is pushed in place the chemical flows through into the spray tank. Four slots, each about a half-inch wide, are cut in the lower half of the big cylinder. These also help emit the insecticide.

A metal cover is hinged to the top of the cylinder. A piece of web belting serves as a gasket. A short piece of pointed three-quarter-inch pipe goes through the cover, the end on the inside being sharply pointed and welded. Holes or slots are drilled in the sides of this portion of pipe.

This foolproof device places parathion in spray rig with complete safety to the operator. Pointed pipes drive holes in can when cover is closed and water under high pressure removes every particle of insecticide from the container. The can-opener is mounted in top of spray rig.

As the "hatch", or cover, is closed and cinched down by a bolt and wing-nut, the pointed piece of pipe drives through the top of the can containing the parathion. The other end of the pipe is attached to the spray-tank pump by means of a rubber hose. When the water is turned on it shoots out the holes and into the can at high pressure. It literally drives the insecticide out.

Jameson has proved that the jet of water will completely clean the parathion out of a can in 10 seconds, but as a further safety precaution he has the operators leave the water turned on for a full minute.

When this insecticide is used, Jameson checks a case of the canned chemical out to a spray-rig operator. As the cans are emptied, the operator puts them back in the case and at the end of the day turns the case of empties back to Jameson who buries them, "just to be on the safe side."

NAMES IN THE NEWS

New Appointments: **Dr. Gordon M. Cairns,** dean of agriculture, University of Maryland, succeeding **Dr. T. B. Symons,** who retired last fall. **Willis Hoard,** manager of the Wenatchee branch office, Washington State Fruit Commission, who succeeds **S. A. DiGiorgio.**

F. E. Price, dean of agriculture and director of the experiment station and extension service, Oregon State College, succeeding **Wm. A. Schoenfeld,** who retired October 1.

Hubert L. Byrd, manager of FMC's John Bean Division at Lansing, Mich., elected a vice president of Food Machinery & Chemical Corp. **Dr. Frank H. Lathrop,** head of the department of entomology at the Maine Agricultural Experiment Station, new president of the eastern branch of the American Association of Economic Entomologists.

J. J. Gardner, executive vice president and general manager, and **John Springer,** secretary, Farmers Tool and Equipment Co. **Hartley Rowe,** vice president and chief engineer of the United Fruit Co., elected to the board of directors.

Retired: Charles F. Kinman, pomologist, USDA Plant Industry Station, in December, after more than 41 years of research and service.

Honored: George Sisler, East Wenatchee, Wash., and **Rex Bowen,** Leavenworth, Wash., both young orchardists, were selected "Outstanding Soil Conservation Farmers of the Year" in their areas. **Arthur J. McFadden,** orchardist and farmer of Orange County, California, was recently awarded the honorary degree of Doctor of Letters at Pomona College Founder's Day exercises.

David S. Weaver, director of the State College Extension Service, named "Man of the Year in Service to North Carolina" for 1950 by *The Progressive Farmer.*

Miscellany: In memory of the late Frank R. Pierce, first president of Dearborn Motors Corp., the 32 Dearborn Distributors of Ford Tractors and Dearborn Farm Equipment have established a foundation to provide fellowships for advanced study by county agricultural agents, according to **Peter Stewart,** president.

Farm equipment manufacturers from 10 southeastern states have formed an organization which is known as South Farm Equipment Manufacturers, Inc. Officers elected were: **John T. Cash,** Knox Metal Products, president; **E. C. Gibson,** Southern Iron and Equipment Co., vice president and treasurer; and **Emmett R. Rushin,** Atlantic Steel Co., executive vice president.

H. C. Brown, associate county agent, Jefferson County, Kentucky, says that "small growers can make big records" and gives as proof **George Burks,** who picked 280 crates of strawberries from a little less than three-quarters of an acre.

Troy E. Cribb, nationally known in the fresh produce industry and instrumental in forming the National Peach Council, resigned as general manager of the South Carolina Peach Growers Association. He will devote full time to his own firm in Spartanburg.

Announcing THE

25,000 cfm

SUPER BES·BLO

Blower for Attachment to your Sprayer

Latest addition to the *complete* BES • BLO line —offering a size to fit your needs exactly!

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7,500 cfm; for one-way spraying, adjustable right or left. Weight 230 lbs.
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ORTHOCIDE 406 Wettable has given excellent control of some of the most important fungus diseases on apples, cherries, and many other fruits, vegetables, ornamentals, flowers. Growers are also producing high finish fruit through the use of ORTHOCIDE 406. One test, for example, gave clear-skinned Golden Delicious apples without russeting.

ORTHOCIDE 406 Wettable is a new organic fungicide (containing N-trichloromethylthio tetrahydrophthalimide), chemically different than fungicides now in use. It contains fungicidal value plus safety and low phytotoxicity. It is formulated for most effective deposit on plants and adherence to plants under adverse weathering conditions.

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ORTHO

SCIENTIFIC PEST CONTROL

ORTHO T.M. REG. U.S. PAT. OFF.

World leader in scientific pest control

CONCENTRATE SPRAYING

(*Continued from page* 21)

expensive speedometers are available and can be mounted on either the tractor or the sprayer.

Another requirement is a filling screen with rather fine holes, yet a big enough total volume and area of openings to make possible putting chemicals into the sprayer rapidly. Another is sufficient agitation to break up, wet, and suspend solids rapidly. If there is a centrifugal pump of large capacity as part of the machine, throwing the full discharge back into the tank during mixing is of great benefit. Some find either stationary or truck-mounted mixing tanks economical but they do not fit into all setups.

A further requirement is a combination of water pressure, screens, nozzles, and air velocity that will produce a fine mist, yet not clog. The acreage covered per man-hour and per machine-hour will be poor if there is slow mixing or frequent clogging; furthermore, clogging causes uneven discharge and coverage.

Since it takes a long time to spray out a tank of concentrate spray, many growers will find it more economical to have several conveniently located filling stations than to use a supply rig to haul water. For growers using concentrate sprayers with large tanks, there is economy of time in buying insecticides like DDT and lead arsenate in 10 or 15-pound bags rather than in three or four-pound bags.

Air Velocities

A rather simple principle for concentrate spraying is to fill the largest possible volume of moving air with mist. This is the plan in some commercially produced semi-concentrate sprayers and is done by some fruit growers who have mounted high-pressure pumps and potato-boom nozzles on "double tunnel" speed sprayers. The air velocity of such machines is scarcely enough to cause fine break-up without high-pressure pumps. Rather low concentrations, as 2X, 3X, or 4X, are in use by these growers, who generally get good results.

With more recent speed sprayers which produce slightly higher air velocity (90-100 m.p.h.), the standard centrifugal pumps producing about 60 pounds per square inch of water pressure are used with whirljet-type nozzles which give a minimum of clogging and do not require special screening arrangements.

This general approach utilizing semi-concentrates was successfully used on thousands of acres of orchard in 1950. Several other makes of rather

large air-blast sprayers operate similarly, certain models of Hardie, Robinson, Ryder, and Friend, to mention a few. The Iron Age offers a low compact machine of moderate air discharge that seems especially adapted to closely planted orchards of peaches, etc. Other manufacturers feel they can use the air-blast more efficiently and perhaps get along with somewhat less volume of air by having mechanical oscillation of the air outlet; the Myers concentrate sprayer, for example, and the Bean No. 27, a small rig of this type.

Rotating Type Sprayer Head

The Lawrence Mistomatic utilizes a rotating head consisting of three rather small round outlets adjustable for height and spread. Each outlet discharges toward each tree two or three times while passing, and there is considerable movement of leaves and branches due to the intermittent blasts, giving excellent coverage to well-spaced trees not too large or too dense. Such a machine could not operate in closely spaced plantings and is not at its best where trees are large or dense.

Other machines have a fish-tail outlet that can be set or can be tilted from the tractor seat but does not oscillate during operation. The Buffalo Turbine and the Niagara are of this type and depend on a smaller volume of air at a higher velocity than the more powerful fixed outlet machines first mentioned. The pumps of the Buffalo Turbine and Niagara machines discharge too little liquid for use with 2X, 3X, or 4X sprays, but can be used for more concentrated mixtures.

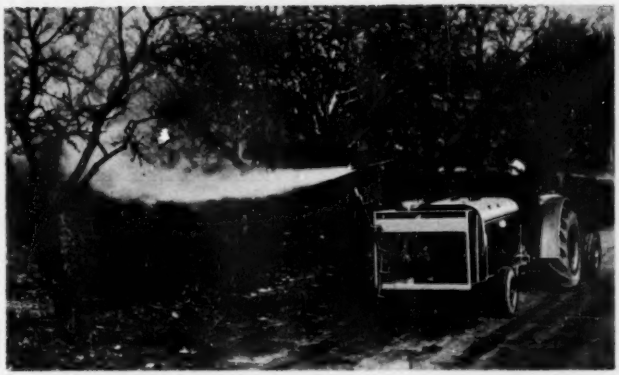
These latter outfits usually have dust hoppers and can be used as wet dusters or dry dusters; in fact, the Niagara is primarily designated as a "Liqui-duster" rather than as a concentrate sprayer. Dust hoppers are optional with most of the other machines named.

Flexible Tube Outlets

All of those mentioned are one-man machines; they are operated from the tractor seat. A few companies put out concentrate sprayers or sprayer-dusters with flexible tube outlets for manual operation. While this is strenuous, it may be the most efficient way to utilize a small air-blast.

If trees are widely spaced in the row, material can be saved by pointing the outlet forward or backward toward the tree while passing, something not possible with the other machines. This saving in material may offset the cost of the added man, in some cases.

(*Continued on page 52*)



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—ANDREW ALFIERI, CALIFORNIA

Orchard and grove men find the Case 3-plow "DO" surprisingly easy on fuel—sometimes taking no more than smaller tractors. Still more important is the low upkeep of the "DO." Its oil-cushioned clutch is full-sealed against dust and constantly lubricated from engine. Its dust-tight disk brakes hold equally well forward and backward. Its power-saving transmission has reversible differential and final-drive parts, for double life. Triple-life steering gear is in same housing, bathed in warm oil. Full-swinging drawbar aids short turns, shifts quickly for offset, locks itself when backing. Let your Case dealer show you the convenience and capacity of the "DO."

Model "VAO" tractor with Case wheel-type heavy-duty offset harrow.

A great low-cost grove tractor is the Case improved Model "VAO." Its Eagle Hitch hooks up in one minute to Latch-on rear-mounted implements that hold their depth. Low-cost tool bar takes spring-shank sweeps, shovels, etc., to form many implements. Latch-on mower has hydraulic control, lifts clear for transport. New hydraulic control acts instantly, moving or standing—works with both mounted and trailing implements.

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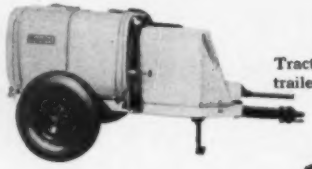
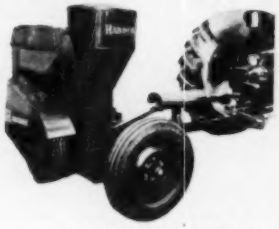
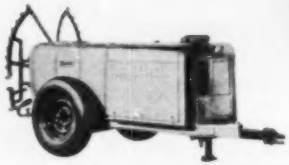


Tractor powered trailers in all sizes.



Hardie Orchard Duster.



Hardie Sprayer fitted with Orchard Boom.

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Hardie brings out a host of new things this year that enable every grower—both large and small acreages—to use the new more powerful pest control chemicals and to enjoy more ease, speed and economy in all pest control applications.

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- Hardie Blo-Spray, a blower and engine unit, converts any high pressure sprayer to an Air Blast Sprayer.
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HARDIE

PEST CONTROL EQUIPMENT

CONCENTRATE SPRAYING

(*Continued from page* 51)

Concentrate sprayers mounted on wheelbarrows or suitable to lift in and out of pick-up trucks are intended mainly for miscellaneous shrubs, trees, ornamentals, etc., such as found on estates rather than for treatment of commercial orchards.

No One All-Purpose Sprayer

There is no machine that is best for all situations. Even the most powerful machines, discharging over 30,000 cubic feet of air per minute at moderate velocity on one side, must be driven as slowly as one and one-half miles per hour for thorough coverage of top and bottom of every leaf and every fruit on large, dense trees. Small, light machines just would not cover such trees.

These powerful machines offer the greatest reserve of power and often can be operated when there is a light breeze. Some can cover fair-sized trees while discharging from two sides. Furthermore, they discharge enough liquid to be used at rather low concentrations, such as 2X, 3X, and 4X, and most investigators feel that the complications and dangers increase with the concentration. On the other hand, they are expensive, heavy machines, requiring a heavy tractor to pull them, and the capital investment is justified only where there is a large acreage to spray. If one has large or dense trees, he had better put all of the air-blast out one side.

The less powerful machines named are also less costly, lighter in weight, and sometimes adequate if the operator is particular to choose quiet weather and drive very slowly, sometimes as slowly as one mile per hour. With machines that are adapted only to putting out higher concentrations like 6X, 8X, or 10X, greater precautions must be taken to avoid overloading some limbs, like those on the outside of the trees closest to the machine.

Conversion Units

The least costly outfits are the fan-and-nozzle attachments such as Besler, Hardie, Hurst, Robinson, and probably other manufacturers sell as conversion units for high-pressure sprayers. They are too new for good appraisal, but the fundamental idea seems sound. With other air-blast sprayers, the trend in air volume has been upward and it seems likely that the more powerful of the attachments will be the better performers. Obviously, they would lack the streamlining that some other machines have.

A few fruit growers have made their own conversions, using standard

blowers. At least one ingenious grower with large trees has one Buffalo Turbine blower at a low level and one at a high level on a high pressure sprayer which feeds the nozzles.

Suitability of Materials

In New York there are a few materials that some of us feel had best not be applied as concentrates. The dormant sprays, abbreviated as DNSBP, like DN 289 and Elgetol 318, might injure branches close to the machine. Dormant oils should be of the Superior or safer type and limited to four or eight gallons per 100 except where the grower has expert professional advice. Parathion as a concentrate offers excessive hazards to sprayer operators, particularly to those who do not observe extreme precautions. Possibly even masks would not be fully effective over a long period with concentrate mists. TEPP requires great care while handling the concentrate to avoid skin-wetting and fumes and while spraying to avoid breathing the mist.

Most of the usual fungicides, insecticides, and hormones are adaptable to semi-concentrate or concentrate spraying, although experience with blossom-thinning sprays as concentrates is limited. With very new materials experience is too sketchy to be sure of safety and effectiveness. Obviously the more solids per 100 gallons, the greater the mechanical difficulties. All concentrates are harder on pumps than are dilute mixtures.

Even with all of these limitations, semi-concentrate and perhaps concentrate sprays are worthy of study for every forward-looking grower. Some saving is a reasonable expectation, and there may be a little improvement in fruit finish as a bonus since the fine spots of concentrate mists interfere less with color development than do the big blotches from dilute sprays.

BUILD FOR THE FUTURE

Economy-minded fruit growers who want to improve and expand their orchard operations and build for the future should have the following building plans which AMERICAN FRUIT GROWER is now making available to its readers.

Working drawings showing construction details are included.

Roadside Market..... $ .50
10,000-Bushel Apple Cold Storage... 1.00
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Here's a fully shielded McCormick O-4 orchard and grove tractor disking between closely-planted trees in a citrus grove.

It's Easy to Get in Close with a *McCormick* Orchard and Grove Tractor

It's no trick to work in close quarters with a McCormick orchard and grove tractor. You don't have to "fight" the steering wheel . . . stop, back, or "jockey" around. Airplane-type double-disc brakes, which operate at a toe-touch, make short turns easy. The turning radius of two-plow tractors is only 10 feet; three-plow, 11¼ feet. You'll like these other McCormick features too:

Narrow, to work easily in tight places, and to turn sharply. The partly shielded McCormick OS-4 orchard and grove tractor, for instance, is only 55½ inches in over-all width.

Low, to work under low-hanging branches. Over-all height of the two-plow models is only 57⅛ inches; of the three-plow models, only 61½ inches.

Your choice of partly and fully shielded styles . . . two and three-plow sizes . . . gasoline and distillate engines . . . and the partly shielded 3-plow ODS-6 with diesel engine. See your IH dealer about a demonstration. International Harvester Company, Chicago 1, Illinois.

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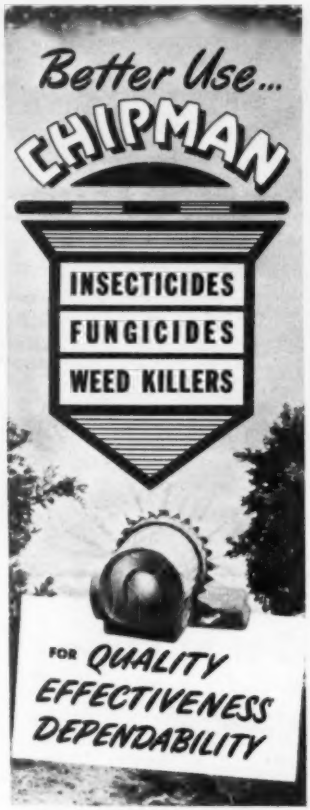

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THIS IS THE WAY TO GROW BLUEBERRIES

MOST FOLKS believe scenic Cape Cod is good for nothing but sand dunes, cranberry bogs, and tourists. But young Malcolm Adams, Barnstable County, West Barnstable, Mass., has different ideas. Just take a look at his backyard and you'll see those bright blue nuggets, from thumbnail size right on up to almost the size of Concord grapes, growing on bushes and known as cultivated blueberries. They're worth their weight in gold right on the front doorstep, and that's what Malcolm is basing his future on.

But cultivated blueberries don't just grow. Far from it. They require a lot of hard work and know how. For instance, when Adams started out four years ago, he set 300 bushes in a plot of land at the rear of his home. Soon afterwards the bushes on half of the plot started to wither.

Blueberries Need Moisture

However, before he had lost too many plants it was discovered the soil in that section was lighter and higher above the water table than that in the other half. As a result the roots weren't getting the required amount of moisture. This was quickly remedied by preparing a new plot and transplanting the ailing plants from high to low ground.

Blueberries require a sandy, acid loam having a high moisture content. Adams points out the moisture content cannot be too high. By this he does not necessarily mean blueberries should be planted in swampy areas where the roots will be submerged. On his own land the 18-inch water table was found to be just about right to give the plants the required moisture.

Malcolm is working on what he calls a five-year plan. It started with his initial order of 300 plants; the second year he planted 240; the third, 275; with 250 new plants ordered in his fourth year, to give him a present total (losses excluded) of 1,076 plants. No bushes will be purchased during the fifth year (1951). This will give Malcolm a chance to see whether he needs more bushes to make a year round living.

Additional land is prepared for the culture of blueberries by plowing in the fall, followed by a spring harrowing. For best results Adams sets his bushes out early in April. If unable to plant a shipment immediately, Adams is careful not to let the roots dry out. His method is to wrap canvas around the roots and keep this wet by sprinkling occasionally.

Malcolm Adams, West Barnstable, Mass., mulches his blueberries with marsh grass.

The bushes should have plenty of room. Malcolm's bushes are spaced 7 x 7 feet as he uses a small Mighty Mite 7 h.p. tractor for weekly cultivation. Every plant gets a good hoeing every week and a half throughout the season. This is necessary as the roots are shallow and would be disturbed if a tractor were used too close to the plant.

All fruit buds are removed when the bushes are set. A small crop is produced the second year after transplanting.

Fertilization

A commercial 7-7-7 cranberry fertilizer is used around the blueberry bushes. *No fertilizing is done the first year as the plants cannot take it.* The second year is really the first as far as fertilization goes. A small handful of 7-7-7 is applied around each plant and is spread out as thinly as possible six to eight inches from the stalk. Fertilizer will burn or kill the bush if applied too close.

Two handfuls are applied around each bush during the third year. In the fourth year, application is increased to three handfuls. Further applications are applied at a per acre rate and broadcast between the rows.

In September, after two years of cultivation, Adams applied a one-foot thickness of marsh grass. By spring this mulch will have packed down to six inches. It serves to hold down the weeds and to retain moisture around the roots. This type of mulching lasts approximately three years. As it is impossible to obtain marsh grass in other sections, Adams suggests the use of pine needles, sawdust, etc.

Average top growth of blueberry bushes is two feet a year. Picking his berries from the beginning of the season until the middle of August, Adams averages eight to 10 quarts daily. These are displayed on a table in his front yard and sell for 90 cents a quart or 50 cents a pint.—*Charles L. Stratton.*

FRUIT DISEASE CONTROL

(*Continued from page 17*)

the fungicides other than sulfur appear to increase the prevalence of mildew in the orchards. Only one of the newer chemicals, Karathane (dinitro capryl phenyl crotonate), seems to have any effect on this fungus. Like other dinitro compounds, it is not safe to use when the temperature is high. This material has not been found very effective against apple diseases other than powdery mildew.

For pear scab and pear leaf blight ferbam has largely replaced all other materials. For pear blight or fire blight copper dusts and sprays applied thoroughly and often to the open flowers have proved effective in reducing infection in semi-arid regions. Recent reports indicate that sprays containing zinc ethylene bis dithiocarbamate (zineb) are also effective.

Brown Rot Control

Brown rot of peach, plum, and cherry is still controlled mostly with some form of sulfur. In recent years emphasis has been directed toward elimination of blossom blight infections. Dilute liquid lime-sulfur, ferbam, Phygon, and wettable sulfur appear equally effective in reducing the bloom infection when applied several times during the flowering period.

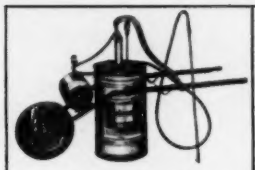
Brown rot of apricot and almond has been controlled effectively by dormant applications of calcium monoarsenite or sodium pentachlorophenate solutions. These dormant sprays suppress the primary conidial inoculum originating from overwintered twig cankers, but under some conditions injury may occur to the young wood from their use.

The gloxalidine (Crag) compounds are effective in controlling sour cherry leaf spot and are being used for this purpose more and more. Fruit size and color are not adversely affected by the glyoxalidine compounds.

Ferbam has been found useful for the control of grape black rot, cranberry fruit rots, raspberry leaf spots, and anthracnose of brambles.

Cold Storage Holdings

An all-time high record of 34 million bushels of apples was reported by the USDA as being in cold storage at the close of 1950. Six million bushels had been taken from storage during December. Pear holdings of 1.6 million bushels reflected a decrease of 600,000 bushels during the month. Holdings of frozen fruits, except apples and miscellaneous fruits, were reduced, with greatest withdrawals reported in strawberries, orange juice, and cherries. Holdings of frozen strawberries, however, and grapes were at new highs for December 31.



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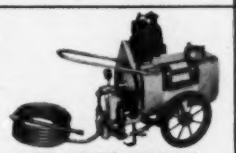

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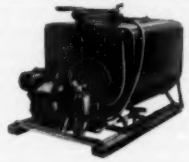

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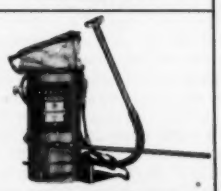

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PARATHION INJURY

(*Continued from page 28*)

and fruit. The foliage damage occurs early in the season in the pre-blossom period and for several weeks following bloom. Most serious injury occurs in the full pink stage with somewhat less at the petal fall period.

Subsequent spray damage is essentially restricted to watersprouts or similar active growth. Parathion causes some injury even at dosages too low for effective insect control. Damage seems to be restricted to actively growing tissue, and only exposed leaves are injured. Growth appearing after treatment develops normally. Typical leaf injury is a burning of margins and parts or sometimes all of the leaf. The injury is similar in appearance to that caused by lime sulfur.

In greenhouse tests with 22 apple varieties, McIntosh, Early McIntosh, Cortland, Kendall, Macoun, and Melba, all of which are related, were injured by low dosages, whereas the other 16 were quite resistant. Field experience has followed the same pattern except that parathion caused a rolling of leaves of Rhode Island Greening and Duchess trees in 1948. There was no burning or crinkling however.

Fruit Injury

The other type of injury has been on the fruit, and again this seems to be limited to McIntosh and a related group of varieties. So far the injury has not been produced artificially and varietal limits are not fully known.

In New York, McIntosh and Cortland have shown this type of injury. The injury occurs as spots on the fruit, apparently where droplets of spray have dried, leaving heavy deposits. At mid-season these dark spots are very conspicuous and are still objectionable at harvest, although not quite as conspicuous.

When stored, injured apples become dimpled because of moisture loss at the injured points. The appearance of the spots at harvest depends somewhat on what time of the season the injury occurred. Fruit injury has resulted from dosage levels of parathion high enough for broad pest control.

Fruit injury has been found in the writer's experimental plots every year, yet it has not followed every spray treatment. A study of the records at Geneva for the last three seasons shows that parathion may injure in any summer spray application and that one spray may cause as much damage as five. Also, it is strongly indicated that parathion sprays injure the fruit only when rain follows within 24 to 48 hours after application. On the other hand, early foliage injury occurs whether wet or dry.

Corrective Studies

Studies on means of preventing parathion injury have been carried on at Geneva in co-operation with the American Cyanamid Co. This work has shown that parathion itself, rather than an impurity, causes the trouble. It was also learned that phytotoxicity could be varied by changing the inert carrier used to formulate the wettable powder, but no carrier was found that gave sufficient correction. Adding absorptive materials to the dilute spray mixture gave the most encouraging results, and activated charcoal proved to be the most practical.

Greenhouse and field tests made over a period of two years show that there are considerable differences between grades of activated charcoal as relate to their corrective ability. The two most promising materials so far are Nuchar C-115N, made by the West Virginia Pulp and Paper Co., and Darco KB, made by the Darco Corp. With two of these products a ratio of three or four parts charcoal to one part actual parathion (one-half pound charcoal for each one pound of 15 per cent wettable powder) has prevented foliage and fruit injury. Other charcoals have worked but only at higher ratios. Limited supplies of charcoal should be available from your local insecticide dealer in 1951.

Effects of Charcoal

As with all new things there are still unanswered questions relating to the use of charcoal in our spray mixtures on apple trees. First, is the possible effect on the insecticidal efficiency of parathion. Although it has been proved that charcoal can reduce the kill of such pests as aphids in laboratory tests, field tests indicate there is no practical loss of effectiveness. Curculio and codling moth control has been as good with charcoal as without.

Second, the charcoal might influence the fungicidal value of materials used in the same sprays. In field tests there have been no observed effects on sulfur and ferbam and no appreciable effect on the mercurials, although laboratory tests suggest the latter materials would be less efficient when used with charcoal.

A third point is the possible effect of charcoal on the tree. Charcoal is, of course, black and gives the foliage a dark appearance but causes no observable ill effects. However, when it is used late in the season, the charcoal deposits on the apples will prevent even coloring of the fruit. Also, the black is somewhat unsightly.

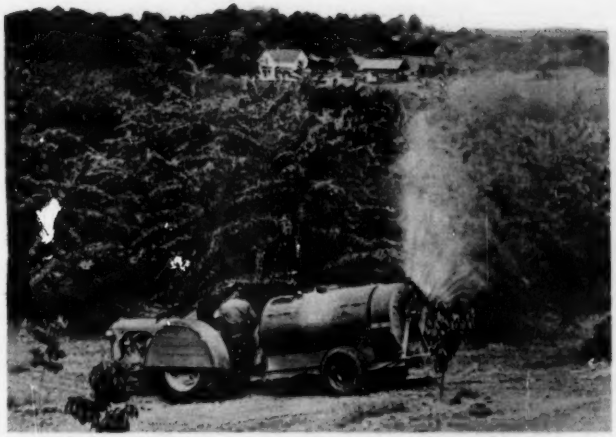
With these uncertainties in mind,

it is the writer's feeling that growers should use charcoal cautiously in 1951. They should limit its use to a small part of their planting. Further, they should use it in the sprays where parathion can be expected to do the most good; namely, the calyx, 10-day or curculio and one or two succeeding cover sprays. Later use is questionable because of possible black residue on fruit at harvest and because parathion cannot be counted on to give control of all the insect pests present during mid-summer. With small scale use over a wide area by numerous growers under varied conditions, we shall learn the practicability of the parathion-charcoal combination and decide whether or not it should be widely adopted for 1952.

NEW BULLETINS

Many publications of the state agricultural colleges and experiment stations contain information of interest to fruit growers from other states. Frequently these bulletins may be obtained by writing the Director of Publications of the college or experiment station concerned. USDA bulletins may be obtained by writing the Supt. of Documents, U. S. Govt. Printing Office, Washington 25, D.C. (They do not accept stamps as payment.)

- **Explanation and Interpretation of Analyses of Irrigation Waters** (Circ. 784, 1948) USDA, five cents.
- **Fruit Maturity and Quality** (Bull. 447, 1946) Ontario Dept. of Agr., Toronto.
- **Nut Growing** (Ext. Bull. 701, 1946) Cornell Univ., Ithaca, N.Y.
- **Pecan Culture and Grove Management** (Circ. 15, 1949) Ga. coastal Plain Exp. Station, Tifton.
- **Home Canning and Preserving of Fruits** (Circ. 394, 1944) Okla. A & M Coll., Stillwater.
- **Home Freezing** (Circ. 153, 1949) Univ. of Calif. Coll. of Agr., Berkeley.
- **Sun-Drying Fruits** (Circ. 392, 1949) Univ. of Calif. Coll. of Agr., Berkeley.
- **Planting and Care of Fruit Trees in the Home Garden** (Ext. Bull. 248 1948) Rutgers Univ. Coll. of Agr., New Brunswick, N.J.
- **Growing Strawberries in the Home Garden** (Circ. 151, 1949) Calif. Agr. Ext. Service, Berkeley.
- **Bramble Fruits** (Circ. 458) Okla. A & M Coll. Ext. Service. Stillwater.



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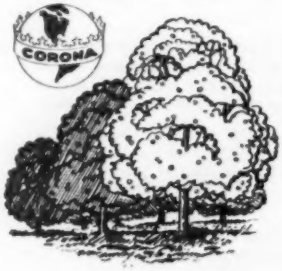

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BOOK REVIEWS

● **Diagnostic Techniques for Soils and Crops** *($2.00) American Potash Institute.* Leading scientists in their respective fields, the authors of this book have attempted to bring together in one volume what is known about diagnosing soil and crop for maximum production. Included are discussions of the newest methods to aid growers in fertilizing their crops effectively and appraisals of their value and use.

● **Recent Advances in Fruit Juice Production** *($2.10) Commonwealth Agricultural Bureaux (London.)* This is the story of the growth and development of the fruit juice industry in England, Canada, Switzerland, and the U.S. Liberally illustrated with charts and photographs, it describes in detail the latest discoveries in technique of production, emphasizing methods of de-aeration and clarification, concentration, retention of vitamins and the fortification of juices with these accessory food factors.

● **Timberland Times** *($3.00) Univ. of Ill. Press.* A once-upon-a-time story by the late Eugene Davenport, for 27 years dean of the College of Agriculture at the University of Illinois, this is a nostalgic record of his boyhood days in the timberlands of the Grand River Valley of Southern Michigan. It is a tale of the character, the life, and the habits of the timberland pioneers written with tenderness and warmth, and it brings to life a vivid era of our country's history.

● **Les Beaux Fruits de France** *($10.00) Editions Delbard (Paris).* A collector's item, this is a beautifully illustrated book with numerous four-color plates, 11 inches x 14 inches, and many excellent black and white photographs. Written entirely in French, it describes and illustrates the fruit varieties grown in France, cultural practices, insects and diseases, processing, and packaging.

● **The Fig** *($5.00) Waltham, Mass., the Chronica Botanica Co.; New York City: Stechert-Hafner, Inc.,* by Ira J. Condit, tells the story of the fig and gives the results of the author's own study and research during the last 30 years. This is not a textbook but is rather a history of the life and culture of the fig.

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NEW WAR ECONOMY

(*Continued from page 20*)

construction. However, it is believed here that fruit growers will be able, through 1951, to obtain materials for needed reconstruction or repair of barns, fruit packing sheds, and for other essential purposes. Finding the materials frequently will be the biggest headache, and, sometimes, you will find yourself invited to take part in a black market transaction to get what you need, in the way of vital building materials, before year's end.

Pesticides and sprays of all kinds will be hard to come by after a few months, if they are not already in some areas. For weeks the agricultural chemical industry has urged farmers to place orders for their 1951 needs as quickly as possible, so that the industry could do its best to fulfill all legitimate demands.

Make Known Your Needs

It still is not too late to make your needs known for the coming season, but it would be better if you had acted already. Last season growers often had to accept substitutes for recommended pesticides, chiefly because there was a shortage of the basic chemicals that go into the manufacture of chlorinated insecticides. This was based on purely domestic labor troubles and the increased demand due to widespread infestations.

Benzol, an important component of benzene hexachloride, and chlorine, used in many pesticides, are used widely for the manufacture of munitions. Alcohol, copper, and lead, also used widely by the agricultural chemical industry, are musts in preparations for a possible general war. It is certain there will be crippling shortages in the agricultural chemicals fields (for farmers) in the coming months due to the inability of current production to overcome the existing deficiency and the increased demands by other industries for the same basic chemicals needed to produce pesticides.

Buy and Store Chemicals

Farmers actually can do themselves—and the nation—a favor by hoarding agricultural chemicals, if they can obtain them. Buying and storing these chemicals on the farm will make space available in the warehouses of the manufacturers. Warehousing fast is becoming an important shortage all its own, and the more farm storage space utilized for this purpose, the better it is for the individual who has the ready supply and for the country.

Container supply already is becoming spotty, according to Washington sources. Nails are becoming increasingly hard to get in normal channels, and supplies of shook, while in ample supply now, are expected to become "tight" very shortly.

Prepackage prospects are bad. A new industry, prepackaging is going to feel the coming months bitterly unless someone performs a miracle. Both industry and federal sources here say that prepackers should plan for an increasingly tight supply on most packaging materials.

Aluminum foil soon will be a complete war casualty, as will all tin foil. There is plenty of burlap for the time being, just as there is plenty of wood in many forms, for a price, but this can be expected to become increasingly tight. Supply of plastic-type materials also is not very encouraging, with armed services making heavy demands on the chemical companies.

Imposition of a new war economy atop the surging civilian boom economy is bound to create terrific dislocations in supplies. It is safe to say that shortages of almost anything you must use in your fruit growing operations will show up from time to time, but that, overall, the supply will be high although the demand will be higher.

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A well-written and profusely illustrated book which deals thoroughly and interestingly with every phase of fruit growing from planting to marketing. An excellent reference book for all fruit growers. 850 pages.

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The 1951 Ford Truck offers the commercial fruit grower the finest in truck construction. The new line of trucks features economy and sturdiness. The automatic power pilot accurately measures the fuel for carburetion and is standard equipment on all motors. New cab motor and steering column design are just a few of the revolutionary Ford features for 1951. Either write the Ford Motor Car Co., Dearborn, Mich., or see your dealer for the facts on the new Ford Truck.

Piperonyl Cyclonene, Pyrethrins, Rotenone

Or, just simply, CPR—is a new chemical manufactured and sold by the U. S. Industrial Chemicals Co., Inc. Rigidly tested, the new compound has proven effective against a wide variety of insects and is ideally suited for small fruits and vegetables. It kills six times faster than rotenone and has a much longer residual effect and is low in toxicity. If you are interested in this new formula, write the U. S. Industrial Chemicals Co., Inc., 60 E. 42nd St., New York 17, N.Y.

A Pippin

The new Gravely Tractor with its 20 attachments will do everything but sell your fruit. The tractor, with attached rotary saw, will interest a great many growers who are looking for ways to cut

- NEW CHEMICAL—CPR
- SHEPPARD DIESEL

orchard costs. Why not write the Gravely Motor Plow & Cultivator Co., Dunbar, W. Va., for their free pamphlet entitled "Power vs. Drudgery."

"Before You Build Your Barn"

This very worth-while booklet is available to all AMERICAN FRUIT GROWER readers; and if you are planning on building a cold storage, packing shed, or almost any orchard building, it will pay you to read this book. Here are listed many ways to cut building costs and to construct orchard buildings that will last. There is no charge for this pamphlet and you can get your copy by writing the Dow Chemical Co., Midland, Mich.

Diesel Tractor

Many growers have wanted a diesel orchard tractor because of low cost of operation and adequate power during the application of dormant sprays when the orchard floor is muddy. The new Sheppard diesel offers every grower these advantages. They will be glad to send you a folder at no cost if you will just drop them a line at the R. H. Sheppard Co., Inc., Hanover, York County, Pa.

Built for the Grower

The new Mack A-30 incorporates all of the features the commercial fruit grower has always wanted in a truck. Low cost transportation of your fruit is assured with the Mack Magnadyne engine. It would be worth your while to write the Mack Truck Co., 350 5th Ave., New York 1, N.Y., for their four-color folder and specifications on the A-30.

USE ELGETOL

THE DINITRO DORMANT SPRAYS COMBINING OVICIDAL, INSECTICIDAL AND FUNGICIDAL ACTION

For the past 12 years, ELGETOL has proved to be a safe, effective form of dinitro for controlling aphis, scale, crown gall and bud moth on apples, peaches, cherries, prunes, plums and almonds. ELGETOL is the original non-caustic, water soluble dinitro dormant spray that is safe and easy to apply. Try it this year for complete and lasting results.

ELGETOL 318—For use on apples, cherries, prunes, plums and certain cane fruits for controlling aphis, scale, bud moth and light to medium infestations of red mite. Use ELGETOL 318 only during the dormant period . . . do not use after the buds swell.

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For the past 3 years, ELGETOL has been giving excellent results in a new test program for the control of Apple Scab. It consists of a combination of two control methods — an orchard floor spray using ELGETOL in the late dormant, and the use of Mercurials in the later sprays. Write for new ELGETOL circular describing this orchard floor spray program.

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STOP SCALE

before it kills your trees

Stop scale *now* before it damages valuable trees and shrubs. Scalecide, applied before new growth starts, also kills aphis, red mite and other overwintering insects. It is the *complete* dormant spray. One gallon makes 16 gallons. Spray anytime temperature is warmer than 40°. Get Scalecide today at your dealer's and be ready.

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There's a Pratt Spray for Every Need

D-X Insect Spray • Pratt's Fruit Tree Spray or Dust
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CLARION DEVELOPMENT CO. Dept. A, Clarion, Pa.

Advertisement

From where I sit ... *by* Joe Marsh

Slim And His "Ali Species"

Slim Baker, who's always doing something crazy, had a lot of people smiling last week because his entry won a ribbon in the Women's Club Annual Pet Show.

Seems as though Slim saw a strange-colored alley cat with no tail over at Central City and brought it home. He washed, combed, and brushed it and put a collar on it with a card reading "Ali Species." Then he entered the animal in the show.

Hanged if the ladies didn't think it was some rare kind of cat and gave it a special award! When one of them asked Slim where she could get one like it, he said, "It's all yours, M'am—I can get an *'Alley Cat'* any time!"

From where I sit, some of us are pretty easily "taken in" just because someone else says it's so. Whether we're awarding prizes or passing on a person's right to enjoy a glass of beer—let's take a good look from stem to stern, and learn what it's all about before making up our minds.

Joe Marsh

Copyright, 1951, United States Brewers Foundation

THE ORCHARD HOME

Poetry, recipes, experience stories—from the pens of our women readers.

From Covington, Ga., a poem, by Mamie Ozburn Odum—

IF YER WANTER PLEASE

If yer wanter please yer homefolks
En git praised up to de sky,
Jest heat dat big ol' iron stove
En bake an apple pie.

Jest sift de flour, knead de do',
Den . . . press yer troubles in;
En when yer roll dat troubled do',
Yer troubles roll out thin!

Den grease de pan, spread de crust,
Pour well chipped apples in;
Den—water, sugar, butter sweet
Den brown de crust 'en grin.

En Lawsy! sech a luscious pie
Dat when de folks sets down,
De las' one am so happy
I cannot fin' a frown.

If yer wanter please de home folks
En git praised up to de sky,
Jes heat dat big ol' iron stove
En bake an apple pie.

From Carthage, Mo., an experience story, by Mrs. Harley B. Clark—

IT'S THE BERRIES

We've often heard the expression, "It's the berries!"—meaning the idea was a good one. Well, the berry idea—particularly blackberries—has been a profitable one for me.

The ground where my berries grow has made more money than any other like dimension of soil on our 10-acre tract. In 13 years I have failed only one year to sell blackberries. Aside from those canned for home use, I have averaged approximately $15 to $50 yearly.

These berries, the Early Harvest variety, had very little time given to them other than planting and picking. With cultivation and pruning they would have produced more.

Gooseberries, too, require little care. I give mine one thorough arsenate of lead spray just after they bloom if there are indications of the tiny green caterpillar. These berries must be taken up and replanted about every fourth year. Keep out weeds but do not cultivate. From 24 bushes, set two years previously, I harvested 24 gallons one year! They brought $1.00 per gallon. This was a record, but they average well.

I use well-rotted barnyard manure around all berries, applying it in the fall. For care and planting follow your local nurseryman's advice.

To market I run a small advertisement in our local paper and have no trouble disposing of my berries here at my home.

My hobby? "It's the berries!" as well as writing.

Not recipes but suggestions for using dates, by Roberta Allen, Hollywood, Calif.—

—Fill spiced peach halves with a bitey cream cheese, cover with sliced date rings, and add clove-flavored peach vinegar.

—Combine date chunks with either green-edged avocado or canned pears, making zestful with a French dressing that has a little tabasco.

—Top grapefruit slices with a dressing in

which is mixed cottage cheese and chopped dates.
—Cover a plain Bavarian cream mold with whipped cream into which have been folded pecans, chopped pineapple preserve, and date fondant.

From the other side of the world comes an original recipe, worked out by the trial and error method, by Mr. W. Meads, Bulls, New Zealand—

CITRUS MARMALADE

3 lbs. lemons
6 lbs. sugar
10 cups water

Cut the lemons (Ponderosa or Wonder lemons preferred) into thin slices and tie the seeds in muslin, discarding only the thin stalk through the middle of the lemons. Cover with the water and let stand overnight.

Boil until tender along with the seeds and then discard the seeds. (The reason for boiling the seeds is to get the pectin out of them which makes the jam set better.)

Leave until next day; then add the sugar and boil until set.

The favorite fruit recipe of Mrs. Lloyd Barnhill, Granger, Wash., is for Apple Candy—

APPLE CANDY

2 envelopes gelatin
1¾ cups applesauce
2 cups sugar
1 teaspoon vanilla
1 cup chopped nutmeats

Soak gelatin in ¾ cup applesauce for 10 minutes. Put 1 cup applesauce and sugar in pan and bring to boil. Add first mixture and boil 20 minutes, stirring. Cool, add vanilla and nuts, and pour in buttered pan to set. When firm, cut and roll in powdered sugar.

Here's an easy way to make a fruit cake, according to Mrs. Dan Hendrix, Tallassee, Ala.

ICE BOX FRUIT CAKE

1 lb. raisins
1 lb. pecans
1 bottle cherries
1 box cocoanut
1 lb. vanilla wafers
1 can Eagle Brand milk

Crush the vanilla wafers; add all ingredients and combine thoroughly. Place in trays and chill.

Mrs. Ada M. Burkhart, Lititz, Pa., hopes that her recipe will be enjoyed as much by our readers as by her family—

GRAPE PIE

3 cups Concord grapes
1 cup sugar
3 tablespoons flour
1 tablespoon butter
1 tablespoon lemon juice
Pastry for two 9-inch crusts

Wash, drain, and stem grapes. Remove skins and simmer pulp for five minutes. Do not add any water to pulp. While hot, press pulp through a sieve to remove seeds. Combine strained pulp with skins.

Combine sugar and flour and add to grapes. Blend in lemon juice and melted butter. Pour in pastry-lined plate. Cover with top crust or strips. Bake at 425° for 10 minutes; then reduce heat to 350° for 30 minutes.

ATKINS

"Silver Steel"

PRUNING SAWS for every PRUNING JOB!

There is an entire "family" of Atkins Pruning Saws—models designed to fit your specific needs—models to do a better job, regardless of kind of orchard or types of trees! For example, the Folding Pruner (right) carries easily in your pocket—because the lacquered hardwood handle folds over the carefully tempered hook back peg teeth. Ask to see it—

No. A-18 FOLDING PRUNER

No. 16—"Silver Steel" blade, peg teeth, adjustable to cut at any angle—accomodates pole of desired length.

No. 40—Tuttle Tooth Pruner. Extra sharp teeth. Kiln dried, top grade hardwood handle. Roomy grip. "Silver Steel" quality!

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Take the Hard Work Out of Spraying with a

HALE Centrifugal ORCHARD SPRAYER

Above—Side view of Hale Sprayer showing both banks of guns in action.

- The Hale Centrifugal Orchard Sprayer pictured at left will make you money due to efficient coverage; protects quality of fruit.
- Saves time; provides volume large enough to spray as fast as tractor can run. Pumps any desired capacity up to 100 GPM at 600 lbs.
- Saves money. Labor cost is about 1/3 for applying spray compared to previous methods.
- Requires less effort. One man can easily operate sprayer.
- Flexible . . . will handle dormant spray solution as well as usual spray chemicals. Large volume pump is ideal too for feeding trees by spraying fertilizer.
- Versatile. Hale Sprayers are delivered either skid or wheel-mounted.
- The centrifugal pump has fewer moving parts reducing maintenance to minimum.
- Results prove Hale Sprayer value. Owners enjoy freedom from spray troubles.

Write Department A today for Bulletin #302. State size of orchard.

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FOR TREES & CROPS

DUST MIXERS

Shown is Engine Powered Tree Duster. Tree Dusters are made in 10 sizes in Engine Powered Tractor mounted, Traction and Trailer Models.

CROP DUSTERS are made in 12 Sizes and 200 Models

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HENRY NO. 500 SILVER GIANT POWER SHEAR

Makes money for you by saving time and labor.

POWERFUL — takes 2" cut easily.

LIGHT — only seven pounds.

STRONG — built for rough usage. No protruding arms. Easy to operate, worker fatigue at a minimum. Fully guaranteed.

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In this way you will always have at your finger tips a volume of the latest and most authentic information on fruit growing.

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STATE NEWS

(*Continued from page 32*)

izers. Recent research in New Jersey indicates that zinc, boron, copper, manganese, magnesium, and iron might be limiting factors for best fruit production. Too heavy application of the major elements—nitrogen, phosphorus, and potassium—might tie up some of these minor elements. He recommended applications of a better balance of major and minor elements in orchard fertilization programs to get best growth and production.

Lea S. Hitchner, executive secretary, National Agricultural Chemicals Association, urged growers to place orders immediately for expected spray material needs during 1951. Raw materials, including chlorine, benzene, copper, lead, and sulfur, are definitely in tight supply.

Paul L. Putnam of the University of Connecticut pointed out that the national emergency will increase demands for labor and supplies. Growers were urged to carefully plan all phases of farm management, organization, operation, buying, and selling.

Fruit growers Harold M. Rogers of Southington and S. Leonard Root of Farmington received the society's Certificate of Distinction awards for outstanding contributions to the Connecticut fruit industry.—*Arthur C. Bobb, Storrs.*

VIRGINIA — Despite an unusually cold winter and a slow apple market, Virginia fruit growers turned out in record numbers for the annual meeting of their state horticultural society at Roanoke. Secretary John Watson arranged an excellent program and retiring president Robert S. Graves of Syria presided.

Regarding scab, Dr. A. B. Burrell of Cornell stressed the importance of accurate weather forecasts in predicting periods of rain, when trees must be protected against scab. He said that many New York growers have shifted from lime sulfur to milder paste sulfurs in pre-blossom sprays. He reported that in a 10-year test lime sulfur reduced yield by 50 per cent when used all season and 10 per cent when used just in the period before bloom. To avoid spray burn, he recommended coarse sulfurs of 325 mesh or ferbam in the summertime.

An increasing number of New York growers is using half the usual amount of sulfur and one-half to three-fourths pound of ferbam in the bloom and calyx sprays, followed by a straight ferbam schedule for orchards. For trees badly infested with scab Dr. Burrell recommended a mercury fungicide, although mercury is not recommended in cover sprays because of residues. He also reported promising results with Crag 341 and Phygon.

Dr. Edwin Gould of West Virginia told of the significant results he has obtained in tests on the toxic effect of spray residues in the soil. Chemicals used were BHC, parathion, zinc-lime, arsenate of lead, ferbam, sulfur, chlordane, toxaphene, and 2,4-D, applied in amounts equal to that applied in a normal spray schedule in one year, 10 years, and 30 years.

The BHC treatments completely eliminated the cover crop, and peach trees in the 10-year concentration of BHC showed 4.4 times the vigor of check trees. Dr. Gould pointed out that one reason for increased vigor was the extremely healthy condition of the roots of the treated trees. No signs of woolly apple aphis were apparent, whereas the roots of the untreated trees were badly infested.

It is estimated that more than 100,000 young apple, peach, and cherry trees in the Cumberland-Shenandoah region were treated with BHC last season. However, lack of sufficient time for testing prevents

TOWER'S

'FISH BRAND' OILED SUITS and HATS

for spraying protection to outdoor workers

Roomy and of great durability these garments afford the unusual measure of comfort and protection particularly required by sprayemen.

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Last Longer

You'll want a BURKS Dual Purpose Super Turbine Water System because of its LIFE-LOK feature. It'll outlast any other water system by many years—give you more water—at lowest cost.

For deep or shallow wells

BURKS Dual System gives you completely automatic service from deep or shallow wells. New folder explains this, also LIFE-LOK feature. Shows why BURKS is best buy. Self Priming—One Moving Part—Dependable Service. Write for literature—prices.

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GARDEN AND SMALL FARM Tractors

Plow Seed Cultivate Mow Hay and Lawns

Powerful 1 and 2 Cylinder Tractors for Small Farms, Gardeners, Florists, Nurseries, Fruit and Poultrymen.

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Ample Power for Field, Haying and Truck Crop Tools. Run Pumps, Saws and Belt Machines.

Steel or Rubber Tires

High Wheels—Enclosed Gears

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1951 BUZZ MASTER

8 MODELS—$99 up

NOTE THIRD WHEEL

More cutting—"Tomorrow's BUZZ MASTER Today!" See the deluxe riding model. Nothing else like it. Made by the oldest firm in the business—now in our 47th year. Many special features used only on Ottawa Saws. Write for FREE DETAILS.

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Eight 12-oz. Glasses	$4.25
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All pieces hand engraved with your own initials. Postpaid. We satisfy.

ROSE COMPANY

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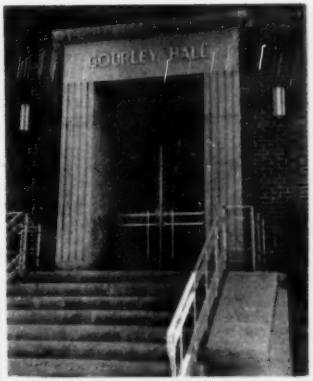
recommending these treatments.

New president of the society is Robert J. Rea of Mt. Jackson.

INDIANA—Meeting on January 10-12 in the Murat Temple of the Shrine, located within walking distance of downtown Indianapolis, members of the Indiana Horticultural Society were pleasantly surprised with their new convention and exhibition hall.

Due to the efforts of a younger group of growers, the society is showing renewed vitality and enthusiasm. Among those who have put their shoulders to the wheel are Past President L. J. Doud of Wabash, President Phil Johnson of Mooresville, and Vice President John Bigley of Culver. For his fine efforts in arranging the outstanding meeting, recently-appointed Secretary Ray L. Klackle was presented with a new pipe at the banquet.

Exhibitors found an active interest in orchard supplies and equipment. Impending shortages and climbing prices are causing growers to place orders earlier than usual. One sprayer salesman reported that his company already had booked more sprayers for delivery this year than were sold in 1950. An insecticide dealer said the price of DDT had risen 12 cents over last year and growers were taking immediate delivery on orchard chemicals for the coming season.



Named in honor of the late Dr. J. H. Gourley, who was head of the department of horticulture of Ohio Agricultural Experiment Station at Wooster from 1921 until his death in 1946, Gourley Hall, at Wooster, houses modern laboratories and control temperature rooms for extensive research in the field of horticulture.

The interesting program featured G. W. Boutilier of Rhode Island who spoke on "How Orchard Practices Affect Storage and Marketing." His colored movies of handling McIntosh in New England elicited a good deal of comment from the Hoosier growers who are not accustomed to handling so tender a variety as McIntosh.

R. R. Tukey of Purdue reported on the new hormone spray chemical, A-1004, produced by the Dow Chemical Co. In 1950 tests this chemical not only did a better job of holding apples on the tree but also showed promise of increasing color development and hastening maturity. In some tests one spray of A-1004 was as effective as two regular hormone applications. More experimental work is necessary before this material can be generally recommended.

In an illustrated talk on soil nutrients,

(*Continued on page 66*)

CROSLEY ANNOUNCES

***NEW!* FARMOROAD**

"It Goes to Town"

ON FRUIT RANCHES

Here's the most versatile vehicle ever. It's a powerful tractor for orchards, groves, truck gardens and farms . . . a fast, economical road vehicle . . . a rugged truck for hauling and towing . . . a mobile power plant—all combined in one lightweight, low-cost machine.

See the Crosley FarmOroad. Learn what it can do for you in your orchard or grove. It's short enough to turn around between rows. It's low enough to cultivate under branches of fruit trees. It's narrow enough to work between vineyard rows. And its 26.5 HP engine gives you *real* power.

Built-in hydraulically controlled drawbars, front and rear. Standard farm implements — plow, disc-harrow, cultivator, posthole digger, snowplow-dozer, reel-type gang mower, sickle-bar mower, front-mounted rotary mower and rake.

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~~CROSLEY~~ FARMOROAD

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Twice the speed of a race horse

DIG HOLES SITTING DOWN

SEEDLING SETTING AND TREE FEEDING MADE EASY

The Danuser Digger attachment for most popular makes of tractors digs hundreds of holes per day with dimensions from 4" to 24". An Earth Drill that is easily installed—quality built throughout, of rugged construction with Timken Bearings—a one-man operation. Eight Augers available in 4", 6", 9", 10", 12", 14", 18" and 24" sizes. For literature illustrating adaptation on your model tractor, write:

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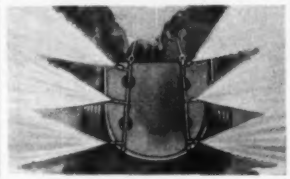
DANUSER DIGGER

Tested and Approved by Most Tractor Manufacturers

Spray easily—Spray thoroughly. Spray and drive your tractor—Save money with

HAMILTON SWIVEL GUNS



Our HAMILTON BOOMS, employing entirely new principle, deliver flat spray, (adjustable to any width) and give amazing drive. Pat. Pending.

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Spray guns of all types—30 years' experience

Only a true timing instrument shows ACTUAL operating hours ... assures proper maintenance

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Engine Hour
METERS

NOT A REVOLUTION COUNTER, but a real clock movement, electrically operated, that shows actual hours of engine operation. It's the only SURE way to save money by timely maintenance of tractors and other powered equipment. You get longer life and fewer repair bills by knowing WHEN to change oil, lubricate, inspect and overhaul.

The HOBBS METER tells you when. Accurate ... precision-built ... easy to install. Low price ... satisfaction guaranteed — see your dealer or WRITE TODAY!

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Does Big Job

Why haul hundreds of gallons of diluted insecticide, fungicide and hormone sprays in tanks which can't travel on soft ground or steep hillsides? The Muto-Mist Blower transforms spray concentrates into a finely divided mist, using AIR as a carrier.

Weighs only 100 lbs.

Write for Detailed Information

Make 1951 your best profit year

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COMING MEETINGS

Feb. 8-9—Idaho State Horticultural Society 56th annual meeting, Hotel Boise, Boise.—Anton S. Horn, Sec'y, State House, Boise.

Feb. 12-15—Canadian Horticultural Council annual meeting, Chateau Laurier, Ottawa, Ont.—L. F. Burrows, Sec'y, 219 Queen St., Ottawa, Ont.

Feb. 12-17—Florida Citrus Exposition, Winter Haven.—John A. Snively, Jr., Pres., Winter Haven.

Feb. 19-21—National Peach Council annual meeting, Chase Hotel, St. Louis, Mo. Feb. 21st meeting to be in joint session with American Pomological Society.—M. J. Dorsey, Sec'y, 1502 S. Lincoln, Urbana, Ill.

Spring meetings Michigan State Horticultural Society: **Feb. 21**—Pontiac; **Feb. 27**—South Haven; **Feb. 28**—Shelby; **Mar. 1**—Traverse City.—H. D. Hootman, Sec'y, East Lansing.

Feb. 21-22—American Pomological Society annual meeting, Chase Hotel, St. Louis Mo. Feb. 21st meeting to be in joint session with National Peach Council.—W. D. Armstrong, Sec'y, Princeton, Ky.

Feb. 21-23—Ohio State Horticultural Society annual meeting, Netherlands Plaza Hotel, Cincinnati.—C. W. Ellenwood, Sec'y, Wooster.

Apr. 3-4—Vermont State Horticultural Society annual meeting, Middlebury.—C. Lyman Calahan, Sec'y, Burlington.

Apr. 3-5—Produce Prepackaging Association First Annual Conference and Exposition, Neil House Hotel, Columbus, Ohio.—Howard J. Ruetenik, General Chairman, Orwell, Ohio.

STATE NEWS

(*Continued from page 65*)

Dr. A. L. Kenworthy of Michigan State College demonstrated how nitrogen, iron, phosphorus, copper, potassium, boron, calcium, manganese, magnesium, and zinc must be in balance for best fruit production. One practice for best balance of soil nutrients that Dr. Kenworthy recommended is straw mulching. His research, he reported, showed that phosphorus and potassium in addition to nitrogen gave better balance than nitrogen alone. One unusual result was that phosphorus and potassium corrected manganese deficiency.

In a discussion of concentrate spraying C. L. Burkholder of Purdue said the No. 1 problem is obtaining coverage. He indicated that under conditions of low humidity the fine droplets delivered from a concentrate sprayer may dry out before hitting the foliage and consequently will fail to stick. Growers stressed the importance of pruning to open up the trees for better coverage.

FLORIDA—Progress in research, improved practices and equipment, improved marketing, good crops, and more unified and efficient industry organization were credited, during the annual meeting of the Florida State Horticultural Society in Winter Haven, as major factors for the cheerful outlook for citrus. Over 600 growers, research workers, marketing specialists, and processors attended the meeting of the society, the oldest agricultural organization in the state.

G. Dexter Sloam of Tampa was elected to guide the society during its 64th year. Other officers include Dr. Ernest L. Spencer, Bradenton, secretary; Lem P. Woods, Tampa, treasurer; section vice presidents W. W. Lawless, Winter Haven, citrus; M. U. Mounts, West Palm Beach, vegetable; Edwin A. Menninger, Studart, ornamental; T. J. Kew, Winter Haven, processing; and Miss Margaret Mustard, Coral Gables, subtropical fruits.—*Clyde Beale.*

MARYLAND—The 53rd annual meeting of the Maryland State Horticultural Society was rated among our best, with live topics, good speakers, and large attendance.

Growers were cautioned to keep apples at right temperature for best condition, and this fruit must be handled quickly after

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storage, as it loses condition rapidly after 40° temperature is reached. Experimental work showed 50° to be the point at which apples lose flavor, weight, and become soft and mealy.

Chemical thinning of blossoms using guns throwing a small stream instead of spray fog gave partial and safe thinning on some varieties of apples. Earlier spraying at pre-blossom stage has possibilities, but there is a frost hazard to consider.

The use of 2,4,5-T as a harvest spray on apples was described as desirable as it gave good control of drop with low spray material concentration. The chemical hastens color and ripening, and harvesting must be timed carefully to avoid overmaturity of the fruit. This research is still new but has much promise for some varieties of apples.

The causes of apples russeting were ascribed to cold weather, spray pressure, slow drying of spray, and to spray materials themselves. Also it was found that weather caused scalding through evaporation of sulfur and mercury compounds. Some of the worst injury may occur before bloom, and it was found, also, that certain varieties are either resistant or susceptible to injury to either fruit or leaf or both. Grower opinion was that pruning to remove weak wood, fertilization for vigor, and maintaining good soil moisture along with the use of mist-concentrate sprays would help trees and fruit resist spray injury.

Tarnish plant bug, curculio, and oriental moth are the main peach insect pests. A late attack by leaf roller injured apples somewhat, as a DDD spray was omitted where parathion was used. The DDD spray in mid-season will be recommended in 1951.

A panel discussion revealed that now is the time to remove unprofitable trees. Cost of maintenance is increasing; war prospects will not create a wider market for apples; growers should figure production per man-hour of cost rather than yield per acre.

Proportion of young and old trees should be kept at a safe figure; not more nor less than about 20 to 25 per cent of non-bearing trees. Old blocks should be cultivated, heavily cover-cropped, limed, and fertilized in readiness for a new planting, if the site is a good one.

Filler trees were not very well regarded but if used they should be removed at 15 years. Acreages having from one-fourth to one-third of the trees missing should be pulled. Some growers reported planting young trees in old tree rows, then forcing young trees, cutting old trees back, and removing them in about six years.

The last speaker sent the growers home feeling happy that in the Cumberland-Shenandoah area the fruit growing picture is good. There is a goodly distribution of the hard or long-lived varieties such as Rome, Stayman, and York, with a decreasing acreage of the fall and soft varieties that must be rushed into a four-month market against Delicious and McIntosh from other sections. The speaker traced changes in varieties in other sections and there is possibility of more distress in marketing the soft varieties before the situation clears. Growers were cautioned to watch their future planting and to stick to the tried and desirable varieties.—*A. F. Vierheller, Sec'y, College Park.*

CALIFORNIA—The annual report of the California Fruit Growers Exchange turns up some interesting figures. They estimate that during the 1950 season some 30,000 cars of citrus in California and Arizona were destroyed by freezing weather. De-

(*Continued on page 68*)

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STATE NEWS

(*Continued from page 67*)

spite the freeze the exchange sold some $144 million worth of citrus. Bright spot was the biggest orange sizes in five years. Frozen citrus concentrate, which accounted for 11 per cent of the national crop in 1949, doubled to take 22 per cent of the 1950 national citrus crop.

Some 6,000 acres of citrus groves were pulled out of southern California to make way for home developments. Percentage-wise this is small compared to the 320,000 acres still in production. The exchange reports export sales of 1,600,000 boxes of citrus with a value of $5,500,000 f.o.b.—*Jack Pickett.*

ILLINOIS—"How to Get More Good Fruit from Orchard to Consumer," might well have been the theme of the 95th annual meeting of the Illinois State Horticultural Society, held in conjunction with the first meeting of the newly-formed Illinois Fruit Council. The latter organization has as its objective and purpose assistance to Illinois fruit growers in the marketing of their crops.

Dr. George M. Darrow of the USDA discussed three major practices which will help berry growers in times of labor shortage:

1) Use of chemical sprays for weeding berry beds.

2) Clipping the tops off strawberry plants after harvest. At the Beltsville, Md., station he reported that plants clipped immediately after harvest produced many more berries the next season than did unmowed plants.

3) Keeping old plants over for the second season of bearing. At the Maryland station old plants kept over for a second fruiting season produced over 11,000 quarts of berries. A check field in which new runner plants were left for the second season produced only about 7,000 quarts per acre.

In the panel discussions of leading Illinois apple and peach growers, very light pruning before bearing and heavier pruning after full production age is reached were two practices emphasized.

Power pruners are being used more and more on Illinois orchards, the discussions revealed. Claude Boyd of Jonesboro reported that with power pruners and a crew of three men he can prune a mature apple tree in eight to 10 minutes.

There is a trend away from nitrogen alone in Illinois orchards and to the use of complete fertilizers. Growers reported improvement in color and winter hardiness in peaches where they changed to mixed fertilizers. The element potassium has been outstanding in its value. Lime has improved vigor of trees and color of fruit when added to acid soils in southern Illinois.

Concentrate spraying will ultimately come into its own, in the opinion of specialists and growers alike. There already are many concentrate sprayers in use in Illinois orchards.—*Eldon S. Banta.*

NEW JERSEY—Seventy-five years of constructive effort to promote the fruit and vegetable industry of New Jersey were commemorated at the anniversary meeting of the New Jersey State Horticultural Society at Atlantic City. A series of skits was presented to illustrate outstanding events in the history of the society since its founding in 1875.

Following the custom of alternating the presidency each year between the fruit and vegetable sections, C. Richard Applegate, who operates Wemrock Orchards near Freehold, was chosen as president and

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Roy D. Gillette, district sales manager of western New York for the John Bean Division of Food Machinery and Chemical Corporation, died recently as the result of an automobile-train accident.

For over a quarter century Mr. Gillette had been selling sprayers and other farm equipment to fruit and vegetable growers in western New York. An expert on the application of insecticides and fungicides, Gillette rendered valuable service to his many customers.

Traveling with Mr. Gillette was George E. Smith, horticultural inspector in the Department of Agriculture and Markets of New York State, who was killed instantly. Both were returning from an insecticide and fungicide conference at Ithaca, N. Y. Mr. Smith was an authority on nursery insects and diseases and virus diseases of raspberries.

Hilyard S. Simpkins, prominent sweet corn grower of Burlington, was elected vice president. Prof. A. J. Farley was re-elected as secretary.

Throughout the three-day sessions the growers expressed concern about the effect of the national emergency on their 1951 operations, particularly in terms of costs of production. Although a good market is anticipated, New Jersey growers must compete for help with rapidly expanding industrial plants which already are recruiting labor. Most growers are negotiating with the New Jersey Farm Bureau for a supply of Puerto Rican or Jamaican labor which will be imported for the 1951 season. During World War II such help proved fairly satisfactory but required considerable supervision.—*Fred W. Jackson.*

MICHIGAN—Because of the increasing interest in concentrate spraying, four growers—H. T. Nelson of Albion, Rodney Bull of Bailey, Leon Pierson of Ionia, and Ed Duncan of Ida—during the annual meeting of the Michigan State Horticultural Society at Grand Rapids told of their successful experiences in 1950 with this method of spraying.

To supplement this information commercial displays of all types of concentrate sprayers were on exhibit, giving growers an opportunity for close observation and study.

Among the wide range of other subjects presented, Dr. King of Michigan State College discussed the No. 1 apple problem in the state—how to control the red-banded leaf roller. He cautioned that if this pest was a problem in 1950, growers should be on the lookout for it in 1951. His control suggestions were parathion in early sprays and DDD or TDE for control of first and later broods.

An important part of the Michigan meetings is the commercial display of equipment and supplies which this year numbered 64 commercial companies.

The social phase of the meeting included for the first time a reception and square dance. The annual banquet and dance on the second evening of the meeting was attended by over 700 people.

New officers of the society are E. J. Robinette of Grand Rapids, president; C. C. Taylor of Albion, first vice president; Russel Evarts of Metamora, second vice president; Don Hootman of East Lansing, secretary; and Lloyd Spencer of South Haven, treasurer.—*A. E. Mitchell, East Lansing.*

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Quantity prices to commercial growers
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A complete line of apple, peach, pear, cherry and other fruits, selected type Chinese Chestnuts and other nut trees. Blueberry, Boysenberry, Strawberry, Raspberry, Grape Vines and Asparagus plants. Over 80 years production experience guarantees satisfaction. Write for free catalog.
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Indian Summer everbearing $6.00, hundred; $50.00, thousand. Latham, $5.00, hundred; $40.00, thousand. No catalog—order today from this advertisement.
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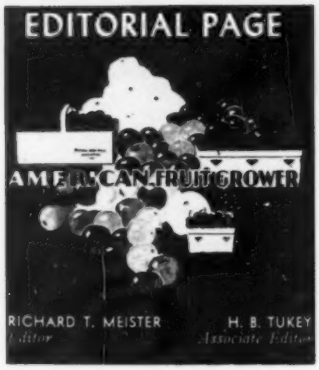

Farm Labor May Be Critical

FRUIT GROWERS who are looking into the future are concerned about the possibility of a critical labor shortage in 1951. Fruits are still picked by hand. This is a big limiting factor in production. Cotton is gathered by machine. So are wheat and oats and the other cereals. Even corn is "picked" to the tune of a tremendous roar and a lot of tractor power. Hay is handled mechanically—cut, chopped, blown into the silo, baled, or bull-raked. Potatoes are dug by machine, flax is pulled, and the harvesting of sugar beets is largely mechanized. But hand picking is still used to harvest most of the fruit crops.

This being the case, it is reasonable that fruitmen should be concerned about the supply of labor. A fortunate set of circumstances resulted in the timely harvesting of the 1950 fruit crops. The cotton crop was short, there was less early season work in southern states. Migrant workers moved to where fruit crops were good and stayed the season. Some have since been absorbed into industry.

During fall and winter growers have had to pay excessive wages—higher than they can afford—in order to get essential jobs done. Industry is already recruiting labor in surplus labor areas. Spring may find the pools nearly dry.

There, however, are steps that can be taken to ease the situation. Still greater efficiency and further mechanization can be realized in various orchard operations. The one-man sprayer is here. Power pruning, palette handling of fruit, conveyors, and other labor-saving devices help markedly to ease the labor situation.

Beyond such mechanization, knowledge and understanding and group action are imperative. Good employee-employer relations must be zealously guarded and vigorously encouraged.

The season of 1951 could be unpleasant in more ways than one. Labor could be the Achilles' heel.

Co-operate!

AS POINTED OUT in the editorial on the right, fruit growing is big business. Growers spend millions of dollars yearly for the essentials to produce fruit to feed growing America.

Any business today thrives only under the impetus of the enthusiastic co-operation of those intimately associated with that business. Realizing this, the state of Virginia a number of years ago passed a state apple law to raise money to promote apples so that all growers—and Virginia growers in particular—would benefit.

This law was challenged recently by a grower as being unconstitutional and discriminatory when a judgment was brought against him for collection of unpaid taxes, interest, and costs on his 1947 apple pack.

The court, in replying, stated that a law to promote the sale and consumption of Virginia apples is for a public purpose since the citizens at large gain benefits from any increased sale of Virginia products.

Some day there may be a better way to raise money for the promotion of one of our major fruits which will meet the approval of everyone concerned. But until that day arrives the co-operation of all growers in merchandising and promoting quality fruit and in supporting state apple laws is urgently needed.

Fruit Production at a Glance

	Average 1939-48	1949	USDA Jan. 1, Est. 1951
	Thousand Boxes		
Oranges			
Calif., all	48,453	41,930	40,400
Navels & Misc.	18,462	15,630	14,500
Valencias	29,991	26,300	25,900
Florida, all	42,780	58,500	61,000
Early & Mid-season	23,250	33,600	34,000
Valencias	19,530	24,900	27,000
Other States	4,542	3,105	4,640
Total & Early Midseason	44,720	51,295	51,380
Total Valencias	51,351	52,240	54,650
Tangerines	3,630	5,000	4,600
Grapefruit			
Florida	26,450	24,200	31,000
Texas	18,187	6,400	11,000
Other States	6,085	5,900	5,520
Lemons	13,055	11,360	12,500

This Business of Fruit Growing

A GENERATION or two ago everybody was reveling in the nostalgic ideas of peach blossoms, lilacs, and a home in the country. There was a lot of important talk about rural life and about farming as a way of life. It didn't matter quite so much about the material things as it did about the wife, the family, the friends, and the rural qualities of living. A man could get quite sentimental and could work himself into quite a dither.

Every once in a while someone now begins to talk about the sentimental side of the fruit business. And while it does have some real significance and meaning, the idea needs a little analysis under the light of present problems and conditions.

To begin with, when grandfather was in the business the need for cash dollars was not so great. In fact, the biggest item of expense was food and shelter. The food came largely from the farm, and the shelter came largely with it. There was still some bartering and exchange of work.

Today the story is different. The fruit grower doesn't have a cow; he may not even have chickens. He is generally a specialist in the fruit business.

Payment for spray materials and fertilizer is made in cash. Spray equipment, trucks, tractors, conveyors, cold storage, and packing shed are paid for with cash. No longer is the biggest expense just food and shelter for the family. The days of barter are gone. The grower cannot trade work with the refrigerator manufacturer who makes the machinery for the farm cold storage, and he cannot watch the electric generator in return for someone to help pack apples. It is now all based on the dollar as a medium of exchange, between experts in their respective lines, for services rendered.

More and more the grower is dependent upon a fair balance between the dollars he receives when he sells his fruit and what these dollars will buy. Fruit growing has become a business, just like any other business. The fruit grower is a manufacturer, just like any other manufacturer. As a manufacturer he can stay in business only so long as he can make a fair return on his labor, managerial ability, and his investment.

To be sure, there is real satisfaction in growing fruit. But, likewise, there is real satisfaction in building a bridge or winning a lawsuit. The way-of-life philosophy is pleasant but it is no longer enough. The sooner we understand this principle and work determinedly with this in mind, the better for all.

Now is the time to meet Your OLIVER Dealer

Your Oliver dealer can be, and is willing to be, your best ally in the coming campaign for food production. He will help you keep the machinery and tools you now own in top operating condition. He is your best source for repair parts and shop service. If he checks your equipment now, he may be able to prepare it for strenuous years to come—at low cost.

Because he knows farming, as well as machinery, you will find your Oliver dealer intensely practical in service or sales counsel. When it comes to the purchase of new machinery, he will show you the finest in farm equipment.

Raydex

"RAZOR BLADE" PLOWSHARES ELIMINATE RESHARPENING

Raydex, the famous Oliver plow bottom that ends the nuisance of share resharpening and repointing, is a *big* money saver. A Raydex share is so low in cost you can discard it when worn out—as you would a dull razor blade. *A brand-new, perfect fitting Raydex share generally costs no more than a blacksmith charges for resharpening an ordinary plowshare.* Yet, you can often plow *more* acres with a Raydex share than with a single resharpening of a conventional share. Raydex shares come in handy cartons of six. The OLIVER Corporation, 400 W. Madison St., Chicago 6, Ill.

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BUT THE SURE EASY WAY to solve the problem is with *Orchard Brand* . . . the dependable line which has earned a time-tested reputation among commercial growers for consistently high field performance. That's because *Orchard Brand* products are carefully formulated and backed by sound research and thorough field testing before they come to you. As a result—they can be counted on to give smooth, even spray covers with maximum deposits and minimum run-off of the active ingredient.

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For smooth, even spray covers! Maximum Deposits! Minimum Run-Off!